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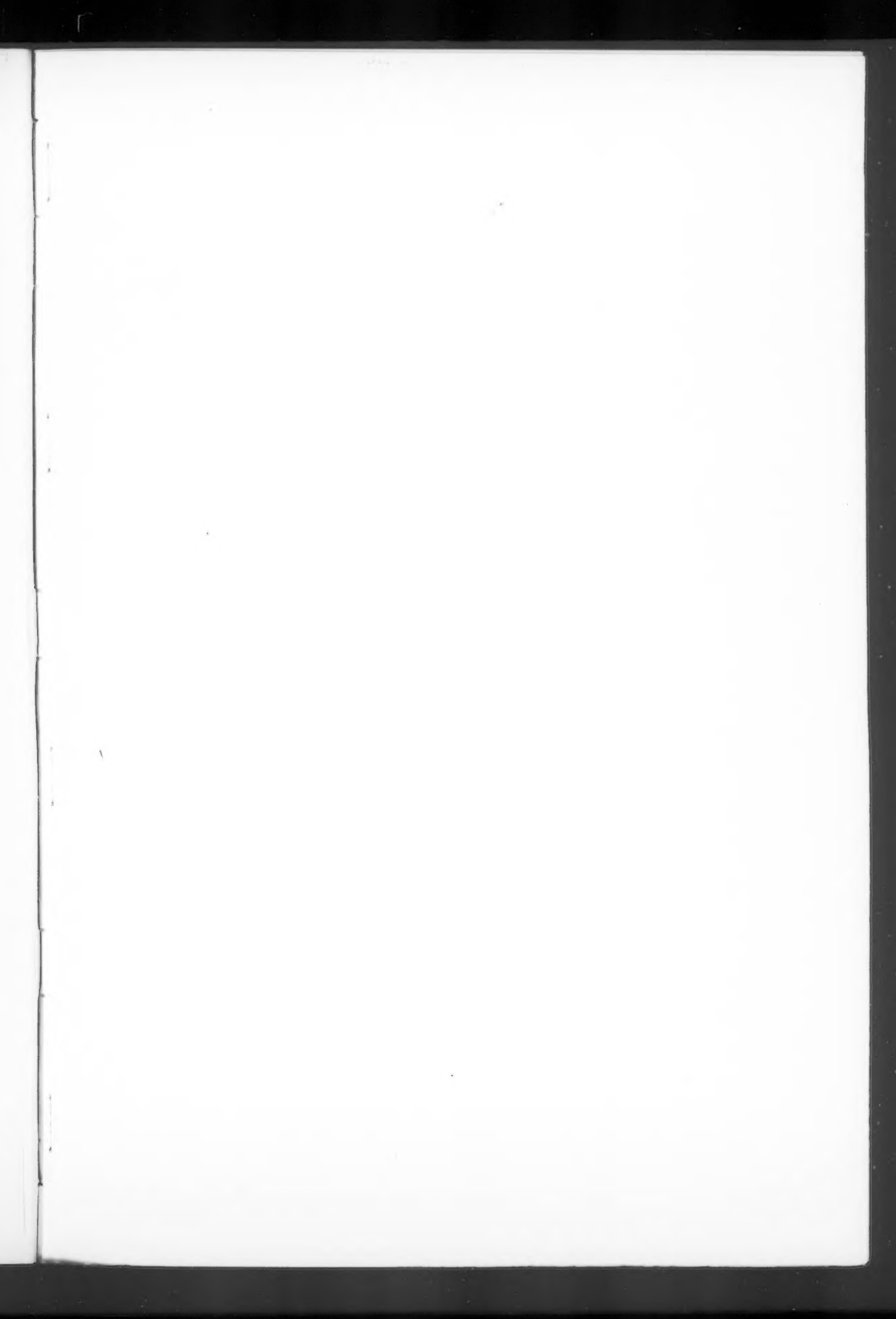
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CONTENTS

	PAGE
Red-tailed Hawk, Painting by Allan Brooks.....	opposite 97
California Gulls and Exotic Eggs.....	Arthur C. Twomey 97
The Nest and Eggs of the White-bellied Wren.....	George Miksch Sutton 101
Notes on the Distribution and Taxonomy of Mexican Game Birds.....	Frank A. Pitelka 113
The Summer Bird Life of Attu.....	Rowland Steele Wilson 124
Juvenal Horned Lark, <i>Eremophila alpestris merrilli</i> , a sketch by Allan Brooks.....	130
FROM FIELD AND STUDY	
Raptorial Hosts of Protocalliphora.....	Harold M. Hill 131
A New Western Race of the Nighthawk.....	Roland W. Hawkins 131
The Whistling Swan in the Upper Pliocene of Idaho.....	Alden H. Miller 132
Wren-tits in the Roseburg Area, Oregon.....	Gordon W. Gullion 132
A Late Fall Record of the Poor-will in Oregon.....	Stanley G. Jewett 133
Scrub Jay and Sparrow Hawk Roosting in Cabin.....	Keith L. Dixon and Philip H. Kruttsch 133
Unusual Feeding Behavior of the Brown Thrasher.....	James Hodges 133
An Altitudinal Record for the Great Blue Heron in California.....	Milton Hildebrand 133
Occurrences of the Emperor Goose in California.....	Don C. Fisher 133
The Prothonotary Warbler in Arizona.....	Max M. Peet 134
The Cardinal in Oregon.....	Stanley G. Jewett 134
NOTES AND NEWS.....	135
COOPER CLUB MEETINGS.....	135





RED-TAILED HAWK
Painting by Allan Brooks

THE CONDOR

VOLUME 50

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CALIFORNIA GULLS AND EXOTIC EGGS

By ARTHUR C. TWOMEY

The recent paper by Sugden (Condor, 49, 1947:93-96) referring to exotic eggs in nests of California Gulls (*Larus californicus*) suggested the recording of some of my own experiences with these birds. The purpose of this paper is to indicate more fully the range of the California Gulls' feeding impulses during the nesting season.

In July of 1947, while conducting field work in Idaho, I had an opportunity to see at first hand the unusual habit of gulls bringing other birds' eggs to their nests. Through the generous cooperation and assistance of Mr. W. Rodgers, manager of the Deer Flat Refuge in southwestern Idaho, I was able to observe a large California Gull colony (six to seven thousand pairs) on a small island at the east end of the Deer Flat Refuge. The eggs were nearly all hatched, and there were hundreds of downy young scattered over the entire nesting site. It was only a matter of a few minutes until the gulls more or less accepted my presence and began sorting out their young. Adult gulls arrived continuously with food, most of which was a mass of regurgitated material that was almost unrecognizable. In two instances, however, bits of rodent remains were apparent. As I watched, an adult suddenly dropped to within five yards of me and began feeding a three- or four-day old chick. To my surprise a Cinnamon Teal (*Querquedula cyanoptera*) egg was regurgitated intact (see fig. 23). The moment that the egg rolled out upon the ground the young began pecking at it, evidently having learned the appropriate response in past feedings of a similar nature. The adult struck the egg two or three times with its bill and the contents were quickly eaten by both adult and young (see fig. 24). I soon discovered that other birds' eggs were being brought into the colony and fed to the young, although the old birds were eating them, also. The eggs brought in were mostly those of Cinnamon Teal, Ring-necked Pheasant (*Phasianus colchicus*), Coot (*Fulica americana*), Black-necked Stilt (*Himantopus mexicanus*), and Eared Grebe (*Colymbus nigricollis*). Fifteen eggs in all were seen, but the amount of yolk stains around the nesting sites indicated an extensive egg collecting campaign on the part of the gulls. Eggs were sometimes carried in the bill, but more often they were swallowed and then regurgitated at the nesting site (see fig. 25).

The gulls are naturally colonial in their habits, and their subsequent response to competition for limited nesting sites is extremely vigorous to the point of being detrimental to the welfare of their own progeny. A great many young birds up to a week or so old were found dead on the island. In many cases fatalities were due to the vicious treatment received from adult birds. An adult would not tolerate another young bird other than its own to enter its local sphere of territorial influence. During such defense of the territory, the adult birds responded as vigorously to a four-day old chick as to another adult. On numerous occasions this resulted in critical injury to the young. Such vigorous response of the adults has been attributed to a nervous irritation caused by a

foreign disturbance in the colony. During the course of these observations the utmost care was exercised to avoid disturbing the nesting group, and within a few minutes after reaching the island, adults were feeding young and incubating eggs within five yards of us.

These large gulls apparently do tolerate other nesting species among their own nests under certain circumstances. We observed four pairs of Caspian Terns (*Hydroprogne caspia*), each with a nest of fresh eggs, on the west edge of the gull colony. Despite our



Fig. 23. Adult California Gull in the act of regurgitating a Cinnamon Teal egg.

caution, our presence upset this apparent harmony, for the gulls suddenly attacked the tern nests and devoured the eggs while we were but 20 yards away. Mr. Rodgers informed us that numerous White Pelicans (*Pelecanus erythrorhynchos*) nested on the same island three years ago, but this year only four pelicans were observed. The main pelican colony was on an island at the northwest end of the lake.

Another instance of intolerance among California Gulls was encountered in 1927 when I often visited a large colony of California and Ring-billed gulls on an island in Bittern Lake, Alberta, Canada, where we carried out rather extensive banding activities. On one of my visits in the company of Mr. Frank L. Farley of Camrose, Alberta, we had just stepped out of our canoe when we heard a Canada Goose (*Branta canadensis*) honking. There had been a goose nest on a high knoll in the center of the island, where it was completely surrounded by the gull colony. On this particular day the four young goslings had just hatched out and were at the moment of our arrival being taken by the parents to the water. The downy young were hardly more than 100 yards from shore when several California Gulls began to circle them. Almost immediately the gulls dropped to the water and began striking the young goslings on their heads with their bills. Two of the young dove at the approach of the gulls, which seemed intent upon

dispatching them. The gulls swam in circles over the spot where the downy geese had disappeared below the surface of the water, and the moment a young bird surfaced, it was struck on the head. In a matter of five minutes the four goslings were dead and were being carried to the gull colony. We had known for some time that Canada Geese nested on the island, but we had no idea that the adult geese would be so helpless in protecting their young, even from gulls. California Gulls do not choose only to take small birds and eggs for food, as our observations at Bittern Lake indicated that they would bring in such large animals as Richardson Ground Squirrels (*Citellus richardsoni*), half-grown coots, and young ducks. In one instance a half-grown gull was found dead with an adult gopher half way down its throat. The gopher was wedged in the throat so that it could not be swallowed or thrown up.

From all observations the food offered by the California Gull to its young is extremely



Fig. 24. Young California Gulls feeding on contents of egg.

varied. On Deer Flat Refuge we saw the remains of young ducks, coots, rodents, eggs and, in one instance, an immature robin. Such evidence of wide-ranging predation on the part of a nesting colony might possibly be used by various agencies as an excuse to destroy this beautiful bird. Certainly no action of any kind, no matter how apparently justifiable it might seem, should be taken against any of the remaining American bird or mammal predators until all phases of their feeding habits and life-histories are fully studied and evaluated. Anyone who has observed the California Gulls as they follow the farmer's plow picking up great quantities of agriculturally injurious insects knows that the birds are of very considerable importance to the farmer. This beneficial habit alone would outweigh their harmful tendency to pick up other birds' eggs and young during the nesting period.

In the literature there is ample proof of the value of this gull to the farming interests of the western plains where it has its principal breeding range. A quotation from Bent (U. S. Nat. Bull. 113, 1921:129) emphasizes more fully the agricultural usefulness of the bird.

"Gulls go all over the State [Utah] for insects, the greatest number visiting the beet fields, where they keep down the crickets, grasshoppers, cutworms, etc. They took a new diet this summer. Some alfalfa fields were so badly honeycombed with mice holes and runs that it was impossible to irrigate

them, and they were plowed up, mostly for beet culture. When the water was turned into the irrigation ditches the mice were forced out of their holes, and the gulls then caught them. They became so perfect in their work that they kept abreast of the head of the water and picked up every mouse that appeared. When gorged with victims they would vomit them up in piles on the ditch bank and recommence their feeding. Gulls are sacred in Utah, and are so tame that oftentimes they may be caught by hand as they follow the plow so closely."



Fig. 25. California Gull with egg about to be regurgitated. Egg revealed by bulge in neck of adult in foreground.

Undoubtedly, there is a marked physiological chain of reactions set up during the breeding cycle that is in direct response to hormonal influences. The apparent outward responses of birds to such physiological changes are extremely varied in relation to their physical environment. Measured by human standards as to whether they are beneficial or harmful to man's interests, the gulls are normally considered predators in varying degrees of activity.

It seems that early in the breeding season the gulls may bring other species' eggs to their nests but because of inadequate stimuli they may not feed upon them, which possibly accounts for the appearance of these exotic eggs in their own nests. After the hatching of the young gulls, however, egg feeding begins, and the young probably figure importantly in stimulating this behavior. The nesting period over, this feeding stops and the gulls return to following the farmer's plow or spread out over a wide range as scavengers.

Carnegie Museum, Pittsburgh, Pennsylvania, January 19, 1948.

THE NEST AND EGGS OF THE WHITE-BELLIED WREN

By GEORGE MIKSCH SUTTON

The White-bellied Wren (*Nannorchilus leucogaster*) is a small, plainly colored, almost exclusively Mexican wren which is far more often heard than seen. It is smaller than the House Wren (*Troglodytes aëdon*) and is brownish gray above and grayish white below, and has a fairly distinct grayish white superciliary line. Its wings and tail are faintly barred with dark brown. Its most distinctive feature is its stubby tail, which is only a little more than an inch long.

In the Gomez Farias district of southwestern Tamaulipas, where I first encountered this wren in early March of 1938 (Sutton and Burleigh, 1939:36), it lives principally in the thickets of *huipilla* or wild pineapple (*Bromelia pinguin*), a tough, barbed xerophyte which grows in dense, waist-high mats throughout the brushy woodlands bordering the rivers as well as on the lower foothills of the Sierra Madre Oriental. Here the bird spends much of its time close to the ground, feeding at the bases of the leaf-rosettes, keeping itself more or less hidden even while singing. Its song, a tinkling, ebullient *pret-til-ly, pret-til-ly, pret-til-ly*, is instantly recognizable as a wren's because of its rhythmic quality. As the bird sings it lifts its head, but ordinarily it does not assume the head-straight-up, tail-straight-down posture which is characteristic of so many wrens. Two other bird species, the Cinnamomeous Tinamou (*Crypturellus cinnamomeus*) and Olive Sparrow (*Arremonops rufivirgatus*), inhabit the *huipilla* beds with it in that region.

In 1938 I searched in vain for the nest of *Nannorchilus*, although I suspected that certain retort-shaped structures which I found on horizontal thorny branches directly above the matted *huipilla* might belong to the wrens. These nests were compactly built, with an inch-wide entrance at the side, which faced downward. They were so deep that I could not reach the bottoms with my finger. In exploring their interiors I found that the floor of the highest part of the entrance tunnel was invariably the twig supporting the nest.

In the vicinity of Valles, San Luis Potosí, where I encountered *Nannorchilus* in the spring of 1939, the *huipilla* was neither abundant nor luxuriant, although in brushy, vine-choked woodlands north of the village scattered stands of the plant, together with a low-growing palmetto, formed a thin understory in which both Cinnamomeous Tinamou and White-bellied Wrens lived. I collected three *Nannorchilus* there, all males—one on March 23, 7 miles north of town; two on May 1, 10 miles north of town. In the May specimens the testes were much enlarged (Sutton and Burleigh, 1940:261), but I did not discover a nest, retort-shaped or otherwise, which I believed might belong to the species.

In the spring of 1941, along the Rio Sabinas, again in the Gomez Farias region of southwestern Tamaulipas, Olin Sewall Pettingill, Jr., Robert B. Lea, Dwain W. Warner and I saw *Nannorchilus leucogaster* daily, often many times daily, from mid-March to early May. We heard it singing throughout this period, and so far as we could ascertain the volume and carrying power of the song did not increase as the season advanced. We repeatedly observed what we believed to be paired birds on established nest-territories in or along the edge of the *huipilla* thicket. Between March 25 and April 13 we collected several specimens, the gonads of all but one of which were much enlarged. We did not, however, find what we *knew* to be a nest of the species, never once saw a bird with nest material or food for the young in its bill, and only rarely were scolded (Sutton and Pettingill, 1942:24).

During our seven weeks' stay that season we discovered six of the retort-shaped nests, five of them quite fresh looking, the sixth obviously old and falling to pieces. At a distance, each of these had the general appearance of a bunch of moss. Each was built at or near the tip of a horizontal or slightly drooping branch several feet out from the trunk in a shaded place. The lowest was between 5 and 6 feet above ground, the highest about 12 feet. To me the most interesting fact about them was that they were, invariably, directly above the *huipilla* thicket. Contemplating this fact, I could not resist the feeling that their builders had found the wild pineapple protective just as the Rose-throated Becards (*Platyparis aglaiae*) and Social Flycatchers (*Myiozetetes similis*), which built their nests out over the river, had found the water protective. I watched the nests with great interest, but I never saw a bird of any sort at one of them.

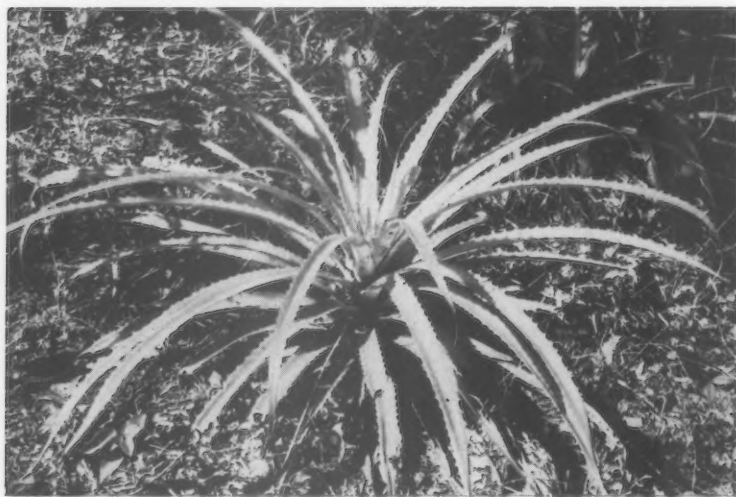


Fig. 26. An isolated *huipilla* plant. Photograph taken near Gomez Farias, Tamaulipas, May 26, 1947, by Robert B. Lea.

In 1947, when I joined the expedition of Robert B. Lea and Ernest P. Edwards for two weeks on the Rio Sabinas in late May, one of my first thoughts dealt directly with the unsolved problem of the retort-shaped nest. I discussed the structure at length, going over in detail my experiences with it in earlier years, and began watching *Nannorchilus*, determined to find out what I could about its nidification. I was far from convinced, even then, that the wrens had built the moot nests.

Not far from our camp, which was on the very bank of the river, a clear-cut trail led from the cane fields through the thicket. There, early on the morning of May 17, while I was intent upon painting, *Nannorchilus* came through the thicket—first one, then another, each singing a tinkling song. Bearing in mind the statement of Wetmore (1943:301), who had described the songs of White-bellied Wrens which he had heard in southern Veracruz as clear, sweet, and "of surprising volume for so small a bird," I listened and watched with keen interest. The birds were singing full force, there could be no questioning of that, for their whole bodies vibrated with the effort, but I still felt

that "tinkling" and "fragile" were the words to use in describing the performance, especially when I compared it with the uproarious *squeal*, *churl*, *squeal if you will!* of a Spotted-breasted Wren (*Thryothorus maculipectus*) which chanced to sing on the opposite side of the trail.

I did not quite settle down to work the whole morning. If I laid aside my painting and watched the wrens they retreated to a distance of 30 to 40 feet, back among the nettles, prickly pear cactus, *huipilla*, and coarse vines; but the minute I resumed my work they returned, following each other from perch to perch, singing at me or at each other, sometimes in duet, but never antiphonally (see Skutch, 1940:295; Chapman, 1929:384). Occasionally they came so close that I could hear the scratching of their feet on the twigs or leaves, and they very nearly alighted on the far leg of the easel. I observed no distinctive adaptation to environment comparable to the Long-billed Marsh Wren's (*Telmatodytes palustris*) straddling of upright stems, and I was struck with the fact that their bearing was not very wren-like in that they virtually never held their short, narrowly feathered tails straight up. They were certainly energetic, however. Hopping from leaf to leaf, resorting to flight only infrequently, they moved through the *huipilla* with surprising speed. Occasionally, for no reason at all so far as I could see, they circled out above the trail or crossed over and left me entirely. On several occasions I watched one of them beating to death and swallowing a spider. I never saw them attempt to capture insects in midair, and they seemed to pay no attention to moths and beetles which flew past them. Now and then they both hopped to the ground and disappeared. Hearing no sound from them I suspected that they had gone to the nest; but the instant I entered the thicket to investigate, the tinkling started and presently they both reappeared, hopping upward through the jagged leaves.

I witnessed pursuit of one by the other, copulation, and, almost immediately thereafter, singing of both birds. In my opinion the male and female sang equally well. The volume of their songs varied. A bird when very close to me sometimes sang almost inaudibly, barely opening its bill; but when it flew a rod or so off, or hid in the vegetation, it sang much more loudly. Neither bird used a call note which I interpreted as scolding.

On May 18, I saw several White-bellied Wrens along the trail referred to above. From their behavior I judged most of them to be paired, but the fact that they invariably sang rather than scolded made me wonder whether they had started to nest. A retort-shaped nest which I found about 12 feet from the ground in a dead thorn tree appeared to be firmly attached, but it was obviously either unfinished or the remains of an old one. I waited for half an hour, heard wrens singing some distance away, but saw no bird of any sort at the nest.

The following day, at about 10 a.m., I returned to examine this nest carefully. It was so clean and firm that I felt it must be new. I could see through it easily, for it had not been lined. I located a pair of wrens, forty or fifty yards away, and sat down to watch them. They sang a good deal at first and scolded a little. The scolding was not unlike that of House Wrens. On meeting each other they sometimes sang in duet. One of them flew off and the other began moving past me in the general direction of the nest. Now, greatly to my surprise, it neither scolded, sang, nor gathered nest material, but hopped upward from perch to perch until it was about 20 feet from the ground and possibly the same distance from the nest and proceeded to sit there quietly for the next 25 minutes! During this time I kept my binocular on it most of the time, for I did not intend to lose track of it. Although virtually motionless, with tail horizontal or hanging slightly downward throughout this entire period, its eyes stayed wide open and bright. As I consulted my watch, I heard a familiar tinkling which suddenly increased in vol-

ume—the singing of the returning mate, which now flew past me. The bird I had been watching came to life, as it were, about-faced, began singing, and flew down to join the other.

On May 22, Ernest Edwards reported finding three nests, each of a different sort, in an acacia tree across the river. Two of these obviously were active, for a pair of Kiskadees and a pair of Social Flycatchers were much in evidence; but at the third nest, which was retort-shaped, no bird appeared. We did not climb up to this nest. We could only guess that it was that of *Nannorchilus*. It was about 15 feet from the ground and was not concealed, although it was in a somewhat more shaded position than the other two nests.



Fig. 27. Nest of White-bellied Wren and nest of black hornets on same branch. Rio Sabinas near Gomez Farias, Tamaulipas, May 27, 1947. Hornets probably *Polybia simillima* according to J. C. Bequaert. Photograph by Robert B. Lea.

On May 24, after watching two White-bellied Wrens along the main trail for a time, I followed an old, little-used trail which led toward an open field and was fortunate enough to find a retort-shaped nest 6 feet from the ground in a small tree growing in

the shade of much larger trees. This was the most beautiful example of the nest I had so far seen. The whole structure was flecked with fresh moss. The fine material lining the entrance tunnel appeared to have been selected with great care and was so fastened in place as to give the impression that it had been woven or spun as a single piece. The structure as a whole was unlike any of the retort-shaped nests I had so far seen, however, in that the bottom of the inner compartment was about on a level with the entrance. I could, as a result of this shallowness, feel the inside of the nest with my finger. The top was rather flat, too. On examining this part critically, I found that it had fallen in or opened up a bit. The structure looked as if it had just been finished; but wait and watch as I did that day and for a time on each of the following six days, I never saw a bird of any sort near it.

On May 26, I once more was fortunate enough to discover a retort-shaped nest, this one about 18 feet from the ground at the end of a long drooping branch in the heart of a fair-sized tree just off a secondary trail. The whole thing was exquisitely fashioned, with the tubular entrance lined as if with spun glass which protruded in a sort of halo, and about 3 feet above the nest, on another twig of the same branch, was the equally large, light gray "paper" nest of a colony of black hornets. As the hornets were at home I realized that I could not possibly reach the retort-shaped nest without cutting off the branch, or pulling it toward the main trunk with a rope, or improvising a ladder. Accordingly, I cut a tall, slender sapling, trimmed off the branches, and, poking this upward through the leafage, tapped the nest gently. At first nothing happened. I waited a moment, then touched the nest again. Again no visible result. The third tap shook the branch enough to rouse the hornets a little and out of the lower, nearer nest popped a wren. It dropped half way to the ground before spreading its wings, whereupon it began a tinkling song, trailed off at an angle to some vines, and, still singing gaily, alighted. At first it held its head low, looking about as if unconvinced that there had been a disturbance. Then, continuing its song, it slipped off through the *huipilla*. It was *Nannorchilus*, behaving now just as I had seen *Nannorchilus* behave hundreds of times.

Bearing in mind my failure ever to follow *Nannorchilus* to its nest, I hid promptly. Some distance away, in the direction the wren had taken, I heard low tinkling notes, possibly from two birds rather than one. I was surprised at not hearing any scolding. Presently the tinkling stopped. After twenty minutes the return of the wren to its nest was announced by the familiar tinkling song. To my surprise I had no trouble in observing the bird, which flew boldly forward above the *huipilla*. It was by itself. It approached the nest by short flights upward from perch to perch. As it drew nearer to the nest it looked about nervously, as if to make certain that the coast was clear. At each perch it sang a snatch of song. It did not scold at all. After reaching a point about 10 feet from the ground, it fluttered upward five or six feet, then, changing its manner of flight, it flew straight and fast at the nest, disappearing at the entrance. I waited almost half an hour longer, but it did not come out; and no other bird appeared.

I showed Lea and Edwards the nest the following day, hoping that the wren would drop out and sing in its descent as it had for me; but repeated tapping with the sapling was in vain. We lingered in the vicinity for some time, but no *Nannorchilus* sang, or scolded, or put in even the briefest appearance.

On May 28 I visited the nest three times, but no wren popped out in response to tapping with the sapling, nor flew up when I "squeaked," nor scolded in the distance. Even the singing of the wrens had stopped in the immediate vicinity.

That day I found another nest, which looked as if it might have been several months old, in a dead thorn tree not far off the main trail, at the edge of a burned-over tract.

About 11 feet from the ground near the tip of a slender upward-sloping branch, and 8 feet out from the main trunk, it was plainly visible from the trail as well as from several points in the thicket. It may well have been built while the tree was alive—before the fire which had killed out the *huipilla* and exposed the brown earth.

I went on visiting the two new-looking nests despite my continuing failure to find birds anywhere about them. On May 30 I collected the one with damaged roof. The one near the hornet nest we planned to collect just before leaving for the north, but last minute complications prevented. On June 2 we left the Rio Sabinas.

On June 2 we made a point of stopping an hour or so about 30 miles south of Victoria at a point on the highway known as the Mesa de Llera. Here, at an elevation of about 1700 feet, a notable feature of the vegetation was the grass which carpeted the dry ground between the thickets. Hoping to find Botteri Sparrows (*Aimophila botterii*), we struck out through the low trees and scattered clumps of cactus.

We had good success in our reconnaissance, to our surprise finding such supposedly forest-loving birds as the Mangrove Cuckoo (*Coccyzus minor*) and the Gray Robin (*Turdus grayi*) nesting almost side by side with the Mockingbird (*Mimus polyglottos*), Varied Bunting (*Passerina versicolor*) and Long-billed Thrasher (*Toxostoma longirostre*), and, to our even greater surprise, finding *Nannorchilus*. The wren was not common, but we encountered a single bird in one thicket, found a pair singing in another, and heard one or more pairs in the distance.

Failing to discover so much as a clump of *huipilla*, I realized that at least one of my ideas about the White-bellied Wren would have to be revised: the species' range did not, as I had so far thought, invariably coincide with that of *Bromelia pinguin*. Here, where hardly a feature of the habitat called to mind the verdant Sabinas bottomlands with which we were so familiar, *Nannorchilus* kept close to the ground; but I had little difficulty in following it about, for there was no dense, ground-covering vegetation at all comparable to the matted stands of wild pineapple in which we had been so accustomed to seeing it.

As I walked round a clump of cactus and thorny shrubbery, I saw squarely in front of me, 7 feet from the ground in a slender, bull's horn acacia, a beautiful retort-shaped nest. I stepped forward, carefully grasped the leaves at the end of a long branch, started to pull the tree toward me so as to have a better look at the nest, and was promptly bitten or stung by ants which swarmed out all over the tree. I peered into the thicket, listening. Nowhere was there a sign of a wren. Bearing in mind the many retort-shaped nests which had turned out to be old or unfinished or unoccupied, I stepped closer and tapped this latest find with my finger. Nothing came out. I tapped again. No bird appeared. Realizing that here at last was an opportunity to preserve a perfect example of the much-talked-about nest, I started to work it loose from the upward sloping twig across which it had been built—when out popped a wren! I was so taken by surprise that I did not quite see what it did as it emerged, but I heard its staccato scolding, saw it gliding, on widespread wings, into the thicket, and watched it shake itself vigorously just after alighting. It was an adult bird, not a fledgling. After tapping the nest again, and hearing no sound of young birds inside, I collected the adult. The mate did not appear. I lifted the nest from its moorings intact. It contained four considerably incubated eggs.

At Linares that evening we prepared the two *Nannorchilus* specimens which we had collected at the Mesa de Llera—the bird which I had got at the nest, and one which Lea had shot a mile or so away on the opposite side of the highway. Each of these had a well defined brood-patch. My bird was a female, Lea's a male. *Nannorchilus* was, then, a

species in which the male and female shared the duties of incubation, sang about equally well, and probably stayed paired the greater part of the year.

DESCRIPTION OF NESTS

I must remind the reader that I have yet to observe a White-bellied Wren actually building a nest. I did see a wren emerge from a nest near the Rio Sabinas, to be sure; and I saw a wren go into that same nest. On the Mesa de Llera I collected a female wren which had four eggs in a nest. Both these nests might properly be called White-bellied Wren nests, it would seem; yet at this writing I do not know what species of bird built them. Two White-bellied Wrens which Frank M. Chapman observed in mid-March, 1896, near Chichen-Itzá, Yucatan, occupied a nest which Chapman believed to be that of the Gray-headed Flycatcher, *Tolmomyias sulphurescens cinereiceps* (1896:277).

The Mesa de Llera nest, which is now before me, is the only occupied *Nannorchilus* nest which I have thus far collected or measured. It does not resemble at all closely any other bird nest with which I am familiar. It is much deeper (longer) than thick, being about $8\frac{1}{4}$ inches long and 5 inches thick at its greatest diameter (outside measurements). Viewed from the front, back, or side, it is roughly elliptical, in full profile being a bit broader and more angular at the top than at the bottom because of the protrusion of the entrance tunnel. This tunnel is so closely attached to the main body of the structure that the nest's really striking resemblance to a retort becomes evident only when one examines the entrance carefully. The entrance tunnel is about 2 inches long and a trifle less than an inch in diameter. The nest-wall varies in thickness from about half an inch (along the floor of the entrance tunnel at its highest point, that is, the point at which it passes over the supporting twig) to possibly an inch and a half (at the very bottom of the nest). So far as I can tell, there are no feathers, fur, nor plant down in the lining.

The nest is made largely of rather loosely interwoven dead plant stems, principally the extremely fine and delicate skeletons of the panicles of various grasses. Scattered over the outside are flattened bunches of bright yellowish green filamentous lichens, tufts of dark green moss, small seed-pods, spider egg-cases, pubescent flower stalks, and wisps of Spanish moss. There are no palm fibers, apparently. The whole structure is colorful and neat, even the outer surface of the bottom being smooth and symmetrical rather than shaggy.

The unoccupied nest which I collected near the Rio Sabinas on May 30 is strikingly dissimilar to the nest just described in that its long axis is almost horizontal rather than vertical. It is, furthermore, considerably smaller, being only about $6\frac{1}{4}$ inches long and $4\frac{1}{4}$ inches thick at its greatest diameter. Its walls are comparatively thin—so thin that at certain places one can easily see through the whole nest when it is held up to the light. The entrance tunnel, which faces almost directly downward, is beautifully lined with very fine panicle-skeletons of grasses which have an almost feathery appearance. The supporting twig, which is only about $\frac{3}{8}$ of an inch in diameter, but very tough, forms the floor of the entrance tunnel at its highest point. This nest may possibly be a "dormitory nest" (see Skutch, 1940).

DESCRIPTION OF EGGS

The four eggs are alike in being wholly unspotted, and rather strikingly glossy. They vary slightly in shape and color, the shortest being a little paler than the other three, the longest being also the narrowest as well as the most nearly elliptical. They measure: 17.4×13.2 , 17.6×13.2 , 17.8×13.3 , and 18.0×12.8 mm. The blown specimens, which have been kept away from daylight almost constantly since they were collected, when carefully compared with the color-blocks in Ridgway's "Color Standards and Color

Nomenclature" (1912) most closely match Pale Turquoise Green, the palest of the four being almost exactly of that shade, the other three being a trifle bluer, perhaps between Pale Turquoise Green and Lumiere Blue.

NOMENCLATURAL HISTORY AND RELATIONSHIPS OF NANNORCHILUS LEUCOGASTER

The White-bellied Wren was described by Gould in 1836 (p. 89), under the name *Troglodytes leucogastra*. The species' habitat, as stated, was "in Mexico, in loco Taumalipus dicto." Gould's spelling of Tamaulipas may possibly have followed current practice in Europe.

J. D. Macdonald has courteously furnished me with two photographs of Gould's type, which is now in the British Museum. Who collected this type I do not know. M. A. Delattre's collections of about that period were made in California and Nicaragua, and it is interesting to note that C. L. Bonaparte, who listed *Troglodytes leucogaster* Licht. (p. 60), in his "Comptes Rendus" article on Delattre's work, and in his considerably emended reprint of this article, both of which appeared in 1854, did so despite the fact that Delattre had neither seen nor collected the bird. As Zimmer (1926:71) has explained, Bonaparte's article was far more than a report on Delattre's work; during course of preparation it became expanded into a "more or less general classification of the avian class."

In 1859, twenty-three years after Gould's description of *Troglodytes leucogastra* had appeared, and again, curiously enough, in the Proceedings of the Zoological Society of London (p. 372), P. L. Sclater re-described this wren as *Cyphorinus pusillus*, basing his diagnosis upon four specimens collected by A. Boucard at Playa Vicente, Oaxaca. How Sclater happened to overlook Gould's description we do not comprehend. His failure to see Gould's type is, however, understandable, for the specimen was not received at the British Museum until December, 1885 (letter of J. D. Macdonald, July 21, 1947).

Baird listed the species in Part I (p. 119) of his "Review of American Birds," published in 1864, on the basis of a single Verreaux specimen (one of the four birds taken by Boucard at Playa Vicente, Oaxaca) in the Smithsonian Institution collection. He called it *Heterorhina pusilla*, employing Sclater's specific name, but referring it to the genus *Heterorhina*, obviously believing that its affinities were with that group rather than with *Cyphorinus*. The only species of *Cyphorinus* which he listed was *C. lawrencii* of Panama.

That Baird entertained an incorrect concept of Gould's *Troglodytes leucogastra* is apparent from his application of the name *leucogaster* to the race of Bewick Wren inhabiting the southern border of the United States and contiguous parts of Mexico. How he could have imagined that Gould's wren, with tail only $1\frac{1}{8}$ inches long (clearly stated in the original description) was a Bewick Wren is beyond us. He may have failed to note the statement of tail-length in Gould's diagnosis.

However it came about that Sclater failed to see or comprehend Gould's description, and that Baird misinterpreted it, Sclater corrected his own error. When he and Salvin published their "Nomenclator Avium Neotropicalium" they listed this wren as *Uropsila leucogastra*, a combination of Gould's specific name with a generic name of their own. The genus *Uropsila* they described briefly, as follows: "Genus cauda exili, ferè sicut in *Henicorhina*, satis insignis, sed naribus, sicut in *Thryothoro*, membranâ obtectis"—a genus with narrow tail, exactly as in *Henicorhina*, sufficiently well marked, but with nostrils, as in *Thryothorus*, covered with a membrane (1873:155).

By 1873, then, the bird had been known by four different generic names—*Troglodytes*, *Cyphorinus*, *Heterorhina*, and *Uropsila*; a total of five specimens were known to

the scientific world; not a word had been published, so far as I have been able to discover, about its habits; and not a person who had written of it had seen it alive.

In 1880, in the first of the three volumes on Aves of Salvin and Godman's "Biologia Centrali-Americana," a brief discussion of the species appeared (pp. 77-78). By that time six specimens had come to light—Gould's type, the whereabouts of which were not at that moment known; the four birds collected by Boucard at Playa Vicente, Oaxaca, three of which were in the British Museum, and one of which (almost certainly a co-type and possibly even the type of Sclater's *Cyphorinus pusillus*, according to word recently received from Herbert Friedmann) was in the Smithsonian Institution collection; and one other (in the British Museum) from an unstated locality in Mexico.

In May, 1884, George F. Gaumer collected a White-bellied Wren at Temax, Yucatan—probably the seventh specimen known to science. In 1887 this became the type of *Troglodytes brachyurus* Lawrence. Since, in his original description, Lawrence (1887:67) made no mention of *Uropsila leucogastra*, we can but assume either that he was unaware of the existence of that bird, or that he entertained a wholly wrong concept of it. The wren which he obviously considered closest to his new "species" was *Troglodytes intermedius*, a House Wren now almost universally regarded as a race of *Troglodytes musculus*.

In 1888 Ridgway, having found that the generic name *Uropsila* of Sclater and Salvin was preoccupied, proposed the name *Hemiura*, selecting Gould's *Troglodytes leucogastra* as the type. Ridgway felt that *Hemiura* was not a very strong genus. He even went so far as to state that he was "inclined to rank" it "merely as a subgenus of *Troglodytes*."

In 1896, sixty years after the species had been described, a few statements at last appeared about the living White-bellied Wren. These were from the pen of Chapman, who, writing of individuals which he had seen in the vicinity of Chichen-Itzá, Yucatan, and which he called *Hemiura brevicauda* (probably a mere slip of the pen for *Hemiura brachyura*), discussed the song as "closely resembling that of *Troglodytes aëdon*," and a nest which, though occupied by two of the wrens, he nevertheless believed to have been built by the Gray-headed Flycatcher, *Tolmomyias sulphureus cinereiceps*. The paragraph is bewildering not alone because it is difficult to understand how anyone with an ear as good as Dr. Chapman's could have considered the song of the White-bellied Wren similar to that of *Troglodytes aëdon*, but also because the two wrens which Chapman had seen using the same nest daily for a week both proved, on collection, to be females.

In 1906, Cole, also reporting on the birds of Chichen-Itzá, Yucatan, listed a female White-bellied Wren taken on February 18, 1904. He considered the species "common" and made this statement concerning it: "I occasionally heard a song much like that of *Troglodytes aëdon*, which, from Chapman's remarks, I attribute to this bird" (1906:135).

Discussing this matter with Josselyn Van Tyne, whose experience with Yucatan birds is extensive, I learned an important fact which Chapman and Cole could not have known—namely that *Troglodytes musculus* inhabits the Chichen-Itzá region. The song of *Troglodytes musculus* is much like that of *Troglodytes aëdon*, as numerous authors agree (see Skutch, 1940:296), so the birds which Chapman and Cole heard singing probably were House Wrens, and the chances are that they did not hear the White-bellied Wren at all. As for the two individuals which Chapman observed occupying the same nest, Dr. Zimmer has ascertained through examination of the specimens that both were, indeed, White-bellied Wrens. To what extent they were using the nest we have no way of knowing. Possibly they were merely roosting in it. We cannot be sure from Chapman's statements that he actually saw the birds carrying grasses to it.

In 1904, Ridgway announced that his own generic name, *Hemiura*, was preoccupied, so he proposed *Nannorchilus*, the name by which the White-bellied Wren has since been known (1904a:202). Recognizing that *Nannorchilus* and *Henicorhina* were very close, he characterized the latter as follows: "Very small Troglodytidae (wing 49-60 mm.) most resembling *Nannorchilus*, but with tail only half as long as wing, nostril opening through middle of nasal fossa, and coloration very different (sides of neck streaked with black and white)" (1904b:607).

I am at a loss to explain the apparent sharp difference of concept concerning the White-bellied Wren's nostril. Sclater and Salvin, in their original description of *Uropsila*, clearly stated that the genus was like *Henicorhina* in all respects save the nostrils, which were covered with a membrane "as in *Thryothorus*." Concepts and boundaries of the genus *Thryothorus* have varied, and will vary, of course. Some taxonomists will agree with Hellmayr (1934), who "lumps" *Thryophilus* and *Pheugopedius* with *Thryothorus*, while others will not. Be this as it may, Sclater and Salvin evidently regarded the operculate nostril as an important character of *Thryothorus*, hence also of *Uropsila*; whereas Ridgway, whose proposal of the name *Hemiura* involved no stated change in the current concept of the genus *Uropsila*, and whose name *Nannorchilus* was a simple replacement of the name *Hemiura*, unequivocally described the nostril of *Nannorchilus* as "nonoperculate" (1904b:617).

Since 1904 surprisingly little has been published about *Nannorchilus leucogaster*. Hellmayr (1934:271-273) lists five geographic races, yet virtually all that has been written about these has concerned measurements and colors of skins, and range. Even Wetmore, who commented on the species' songs, "chattering calls," and behavior in southern Veracruz, may not have realized that he was writing of a virtually unknown bird (1943:301).

What I have seen of living *Nannorchilus*, especially of its nidification, convinces me that it is not very closely allied to any wren which I know at all well. Its behavior resembles that of *Henicorhina* (with which I have had slight field experience) in some ways, although its color pattern certainly does not. It bears a strong color resemblance to *Thryothorus modestus* (which I have never seen in life), although it is much smaller, somewhat less heavily barred on the wings and tail, and proportionately shorter-tailed. The eggs of *Thryothorus modestus* are white.

A comparison of skins of *Nannorchilus* with available specimens representing the genera *Henicorhina*, *Thryothorus*, and other allied wrens convinces me that there is no sound, purely morphological basis for maintaining *Nannorchilus* as a separate genus. When Ridgway studied the bird in 1888 he was tempted to place it in a monotypic subgenus under *Troglodytes*—a disposition which would probably not be very seriously considered today in the light of what we now know about the distribution, behavior, songs, and nesting habits, of neotropical wrens.

What I have just said leads me to summarize certain facts concerning the nidification of *Thryothorus*, *Henicorhina*, and allied genera. Most American ornithologists are familiar with the more or less domed-over nest of the Carolina Wren (*Thryothorus ludovicianus*). Some nests of the closely related Spotted-breasted Wren (*Thryothorus maculipectus*) are similarly domed-over, but others, especially those built "among the thickets and vine tangles" in Costa Rica, are globular, with entrance at the side (Skutch, 1940:309). As for *Thryothorus pleurostictus*, Sumichrast (in Lawrence, 1875:13) tells us of retort-shaped nests which he saw the birds building on the Pacific side of the Isthmus of Tehuantepec; Skutch (1940:303) describes "elbow-shaped" nests examined by him in Costa Rica; and Dickey and van Rossem (1938:428), writing of El Salvador

birds, postulate an interesting relationship between this wren and the Flycatcher *Tolmomyias sulphureus* wherein the flycatcher breeds early and the wren breeds late, using the flycatchers' nests. Chapman (1896:277), it will be remembered, expressed a similar belief that White-bellied Wrens which he observed in the vicinity of Chichen-Itzá, Yucatan, were using the empty nests of *Tolmomyias sulphureus*. As for *Thryothorus modestus*, Skutch (1940:300) describes the "breeding nest" as "a compact ellipsoidal or nearly globular structure with a circular entrance at one end, facing obliquely downward." The same author (1940:302) describes the nest of *Thryothorus semibadius* as "roughly globular" with "a very wide doorway that faces downward or even obliquely inward."

Concerning *Henicorhina*, we find Sumichrast's brief description of the nest of *H. leucosticta* under the name *Heterorhina prosthelauca*, as he observed it in southern Veracruz—a structure "formed of mosses interwoven with great skill" and "fastened to the branches of shrubs . . . so skillfully . . . as to be readily mistaken for a bunch of moss" (1860:545). Todd and Carriker (1922:416) describe the nest of the Colombian race of *H. leucophrys*, under the name *Henicorhina hilaris bangsi*, as a "domed-over structure, placed either on the tip of a horizontal limb or in a tangle of roots under an overhanging bank." Calling attention to a custom among certain wrens which probably reaches its most striking development in *Telmatodytes* and *Cistothorus*, they go on to say that "it builds many false nests, which are always placed in conspicuous positions, while the real nest is most cunningly hidden away."

Apparently there is nothing wholly distinctive about the nidification and nesting behavior of *Nannorchilus*. Several neotropical wrens build retort-shaped nests and at least one other species, *Thryothorus pleurostictus*, lays pale blue eggs (Sumichrast, in Lawrence, 1875:14; Skutch, 1940:303). In several species both the male and female sing and in these same species the sexes probably share the duties of nest-building and incubation. The custom of *Nannorchilus* of carrying its tail horizontally rather than vertically bespeaks a possible separateness from wrens with which I am familiar, but I prefer not to be dogmatic about this until I have observed *Nannorchilus* scolding loudly in defense of eggs or young.

In short, I seriously question the desirability of maintaining a separate genus for the White-bellied Wren. But whether we call it *Thryothorus* or *Henicorhina* must be determined by further study.

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NOTES ON THE DISTRIBUTION AND TAXONOMY OF MEXICAN GAME BIRDS

By FRANK A. PITELKA

Collections of birds from Mexico recently acquired by the Museum of Vertebrate Zoology have yielded new information on the distribution and taxonomy of a number of species. It is the objective of this paper to place on record noteworthy results of critical study of one of these collections, that accumulated by A. Starker Leopold in the course of a survey of Mexican game birds. The present report is thus confined to members of the tinamiform, anseriform, galliform, gruiform, charadriiform, and columbiform groups. There were also included in this study specimens representing these groups, whether qualifying as "game birds" or not, from two other collections: first, the Milton S. Ray Collection of Guerreran birds obtained by W. W. Brown, and second, a collection from Sinaloa and Sonora obtained in October and November, 1946, by A. S. Leopold, F. A. Pitelka, and W. C. Russell. Field observations supplementing data from specimens are added from the writer's original notes on Sinaloan and Sonoran species. Topics dealt with here are range extensions of species, critical evaluations of racial characters, revisions of racial distributions, and new data on seasonal distribution and breeding season.

Crypturellus cinnameus. Mexican Tinamou.—The only record of this species from Campeche known to me is that of Traylor (1941:199), who described *C. c. intermedius* from the southern part of that state. A series of eight specimens taken at San Juan, Campeche (see fig. 28), in the central, coastal part of the state, also represent that race. Comparative material of other races together with an examination of data provided by previous studies of this species (especially Conover, 1933; Brodkorb, 1939; and Hellmayr and Conover, 1942) indicate that *intermedius* represents a valid race.

In describing *C. c. intermedius*, Traylor (1941:200) did not comment on presence or absence of barring on the breast of females (see Hellmayr and Conover, 1942:66-69, footnotes). Five females of that race in the Leopold Collection vary considerably in this character and form as nearly a graded series as could be expected of merely five specimens. One lacks any barring except for a faint suggestion of it on the sides of the breast; at the other extreme is a specimen prominently barred on the upper breast and rather heavily so on the sides of the breast. The other three specimens fall between these. There is some suggestion that this character may vary with age, to a partial degree at least.

Traylor (*loc. cit.*) states that in dimensions *intermedius* "falls in between" the larger races, *sallei* and *soconuscensis*, and the smaller races, *goldmani* and *cinnameus*. No data are given except the dimensions of the type of *intermedius*, a female (wing, 166 mm.; culmen, 25.5 mm.). Dimensions from the series of *C. c. intermedius* in the Museum of Vertebrate Zoology are given in table 1. They suggest rather that in size *intermedius* may be similar to or smaller than *cinnameus*.

Anser albifrons. White-fronted Goose.—But one record of this species is available from Sonora (van Rossem, 1945:44). Nine individuals were noted on a laguna at Pitahaya (40 km. SE Empalme, 100 ft.), on October 29, 1946; these plus six others were present early on October 30. None was seen again until November 3 when two individuals visited the laguna briefly.

Dendrocygna autumnalis. Black-bellied Tree Duck.—Friedmann (1947:190) has described two races, *D. a. fulgens* from extreme northeastern Mexico and southern Texas, and *D. a. lucida* from Sonora and Veracruz south at least to Costa Rica. These are said to differ in degree of blackness of the abdomen, *lucida* being the darker. I have examined ten specimens (6 ♂♂, 4 ♀♀) from these geographic ranges. Friedmann had

Table 1
Measurements of *Crypturellus cinnameus*

	Wing	Culmen	Tarsus
<i>C. c. intermedius</i>			
3 males	154 mm.	27.4 mm.	51.5 mm.
	146	30.2	46.8
	146	27.9	48.3
5 females	148	29.6	48.4
	151	28.5	46.0
	152	28.8	46.2
	147	25.6	45.2
	145	28.5	46.2
<i>C. c. cinnameus</i>			
1 male	156	31.1	47.7
1 female	163	30.2	51.2
<i>C. c. goldmani</i>			
1 male? ¹	152	26.3	47.7

¹Unsexed, but plumage characters appear to be those of a male.

only eight specimens of *fulgens* (4 ♂♂, 4 ♀♀) and 11 of *lucida* (sex representation not given). While there is a slight suggestion of difference between them, this is transgressed by the sexual differences evident in our series. Thus, a male and female collected on August 4, 1945, in Tamaulipas, display the very differences used by Friedmann to distinguish *fulgens* from *lucida*. A comparable degree of sexual difference occurs between a male collected on June 29, 1932, in Costa Rica, and a female collected on July 23, 1912, in El Salvador. Friedmann did not comment on sexual differences within the races he described. In view of these facts, the status of *lucida* is probably doubtful until the characters attributed to it are re-appraised with due recognition of sexual differences.

Cairina moschata. Muscovy Duck.—No previous records from Nuevo Leon have been found. Two females were collected on July 22 and one female on July 29, 1945, at La Union (29 km. NE General Teran, 1000 ft.), in that state.

Anas platyrhynchos. Mallard.—A female was collected at Pitahaya, Sonora, on November 3, 1946. Van Rossem (1945:45) cites no Sonoran records of wintering mallards earlier than December 6.

Anas diazi. Mexican Duck.—The characters attributed to *A. d. novimexicana* by Phillips (1923:56) are "an irregular wavy barring of fulvous color on the mantle" presumably not present in *A. d. diazi* and "a tendency to a darker and more mottled breast." In seven specimens of *A. diazi* available to me, neither of these characters appears valid. With respect to the first, the "wavy barring" is produced by subterminal, more or less V-shaped fulvous marks on the mantle feathers, which, when the latter are worn, become more evident than in fresh-plumaged birds and produce the character described. But these subterminal marks are present in *A. d. diazi* as well as *novimexicana*. What is more significant is their presence in two males and their absence in five females. As to the second character, five specimens from the range of *A. d. diazi* are consistently darker on the breast than two of *A. d. novimexicana*, but there is no evidence of difference in mottling. Our material suggests that if any real differences exist, they are, in *A. d. novimexicana*, lighter ventral coloration, in particular on the abdomen, and more extensive subterminal fulvous marks on back, scapular, and flank feathers, and possibly buffier (less gray) coloration on the throat. Because of individual variation, however, the racial distinctions in this species should be reexamined further.



Fig. 28. Map of Mexico showing localities mentioned in the text. Cuapongo, a Guerreran locality near Omilteme and not found on reference maps, is not shown. A key follows.

SONORA	OAXACA	NUEVO LEON
1. Nogales	18. Tamazulapam	31. La Union
2. Sierra Seri	19. Tlacolula	32. General Teran
3. Guaymas	MORELOS	COAHUILA
4. Empalme	20. Tetecala	33. Hipolito
5. Pitahaya	21. Lake Rodeo	34. Saltillo
6. Bacum	22. Alpuyeca	
SINALOA	23. Cuernavaca	CHIAPAS
7. Mazatlan	24. Tres Marias	35. Monte Libano
8. El Batel	DISTRITO FEDERAL	36. Palenque
NAYARIT	25. Pedrigal	37. San Cristobal
9. Santiago Ixcuintla	ESTADO MEXICO	38. El Real
10. Sauta	26. Rio Frio	39. Escuintla
MICHOACAN	HIDALGO	CAMPECHE
11. Quiroga	27. Lake Tecocomulco	40. San Juan
12. Lake Patzcuaro	28. Apam	41. Campeche
GUERRERO	SAN LUIS POTOSI	YUCATAN
13. Polutla	29. Santo Domingo	42. Xocempich
14. Chilpancingo	TAMAULIPAS	GUATEMALA
15. Omilteme	30. Ciudad Victoria	43. Nenton
16. Atoyac		
17. Acapulco		

I find no references to the occurrence of this species in Morelos, and although thought to occur in Hidalgo by Phillips (1923:56), he had no specimens. I have examined two collected at Lake Rodeo, 4000 feet, Morelos, on March 11, 1945, and one collected at Lake Tecocomulco (25 km. N Apam, 8200 ft.), Hidalgo, on November 19, 1944.

Anas discors. Blue-winged Teal.—A male taken by W. C. Russell at Pitahaya, Sonora, on November 2, 1946, appears to represent the second record for Sonora (see van Rossem, 1945:46).

Spatula clypeata. Shoveller.—No records from Michoacan are known to me. One female was collected at Lake Patzcuaro, 6800 ft., on February 22, 1945.

Aythya valisineria. Canvasback.—Van Rossem (1945) does not list this species from Sonora. A female was collected at Pitahaya (40 km. SE Empalme, 100 ft.), on October 28, 1946.

Aythya affinis. Lesser Scaup Duck.—A male was collected by W. C. Russell at Pitahaya, Sonora, on October 30, 1946. Previously the species had not been recorded in that state earlier than November 10 (van Rossem, 1945:50).

Oxyura jamaicensis. Ruddy Duck.—But three authentic records are available from Sonora (van Rossem, 1945:51). One individual was observed at Pitahaya on October 30 and November 1, 1946.

Ortalis wagleri wagleri. Wagler Chachalaca.—Two specimens were collected at El Batel (70 km. NE Mazatlan, 5100 ft.), Sinaloa, on October 20, 1946. Altitudinal occurrence here is above that of most other records.

Dendrortyx macroura striatus. Long-tailed Partridge.—The Ray Collection contains several specimens that provide data on the breeding period of this species in Guerrero. A female collected on August 2, 1945, at Cuapongo, is marked "ovaries greatly enlarged." A half-grown juvenile from the same locality was collected on September 27, 1940. Another juvenile, in an early stage of the postjuvinal molt, was collected at Chilpancingo on August 20, 1937.

Lophortyx gambelii. Gambel Quail.—Eighteen specimens were collected at Pitahaya and one at Bacum, in Sonora, in the period from October 27 to November 2, 1946. The series includes twelve fresh-plumaged males. These display the characters attributed to *L. g. fulvipectus* by Ridgway and Friedmann (1946:296). Hellmayr and Conover (1942:235) did not find *fulvipectus* separable from *gambelii*, but as Ridgway and Friedmann (*loc. cit.*) point out, truly fresh-plumaged specimens are necessary for comparisons.

According to van Rossem (1932:132; 1945:68) intergradation northward between *fulvipectus* and *gambelii* is confined to the regions east and northeast of Guaymas. A series of 15 Sonoran specimens additional to those mentioned above suggests, however, that this area is better assigned to the range of *fulvipectus*, and that intergradation is evident farther north and interiorward, to the Sierra Seri (opposite Tiburon Island) coastwise and to north-central Sonora interiorward. One specimen in this series, an adult male (MVZ 94933), collected approximately 37 miles south of Nogales, October 27, 1941, is indistinguishable in color from *L. g. fulvipectus*, and the remaining specimens—males and females—are intermediate to varying degree in the several characters distinguishing *fulvipectus* from the nominate race.

Nelson (1899:26) originally described *fulvipectus* as a race not only darker, but also larger in size of bill than the nominate race. The latter distinction is weak and therefore not useful in racial segregation, but it nevertheless exists, as shown by the following data on chord of the exposed culmen:

	Range	Mean
22 ♂♂ <i>gambelii</i> (Calif., Ariz., N. M.)	10.1-11.8	11.1 mm.
12 ♂♂ <i>fulvipectus</i> (southern Sonora)	11.1-12.5	11.7 mm.

With reference to Moore's (1947:28) newly described race, *L. g. friedmanni*, from northern Sinaloa, examination of specimens in the Museum of Vertebrate Zoology from Sonora and neighboring parts of Arizona and southern California suggests that most of the characters attributed to *friedmanni* are either the same as in *fulvipectus* or they

are slight accentuations of them. This is not unexpected in a population to the immediate south of the present known range of *fulvipectus* if we recognize the north-south gradient over Sonora in characters separating *fulvipectus* from the nominate race (see above). If characters attributed to *friedmanni* by Moore (*loc. cit.*) in his description are checked against the series examined in this study, only two of six may prove to represent variations not already indicated in *fulvipectus*. These, in themselves variable characters, are streaking of undertail coverts (darker and "definitely" brown in males of *friedmanni*) and color of forehead (almost "solid" brown in females of *friedmanni*). I have not been able to examine any Sinaloan specimens. Moore examined only eight males and two females of "*friedmanni*." All these considerations lead me to suggest that *friedmanni* is merely an end-point in a north-south gradient already evident and recognized in *fulvipectus*.

Colinus virginianus. Bob-white.—A series of sixteen specimens from Morelos, and particularly eleven of these from Lake Rodeo (15 km. E Tetecala), clearly indicate that the locally resident population of *C. v. nigripectus* is mixed to varying degree by transplants from regions outside of the range of this race. The atypical specimens suggest the races *maculatus* or *aridus*, and it is known that birds from the vicinity of Ciudad Victoria in southern Tamaulipas have been released at Lake Rodeo (A. S. Leopold, MS).

Five males and four females collected at El Real, Chiapas, on November 29 and December 7, 1945, apparently represent the race *insignis*. This locality is outside of the known range of *insignis* and within what is generally considered the range of *minor* (see Ridgway and Friedmann, 1946:338). The type locality of the latter form, Palenque, Chiapas, is only about 45 kilometers northwest of El Real. The range of *insignis* (type locality, Nenton, Guatemala) is stated by Brodkorb (1942:3) as the "Comitan-Nenton Valley of eastern Chiapas and western Guatemala," considerably to the south of El Real. The five males from El Real agree with the characterization of *insignis* given by Ridgway and Friedmann (*loc. cit.*). In this series, the throat is consistently black, and the breast and belly are entirely chestnut. On four there is a postocular stripe, with slight touches of white above or in front of the eye, areas that are otherwise black. On the fifth, a superciliary stripe extends almost to the bill. The fifth in addition is spotted white on the malar area from a point beneath the eye posteriorly to the sides of the throat. The neighboring race *minor*, however, is white-throated. Comparative material available to me is inadequate for evaluation of characters displayed by the four females.

These data indicate that the allocation of all of northeastern Chiapas to the range of *minor* is not correct and that, therefore, there is little likelihood that *minor* also occurs in "the neighboring sections of Guatemala" (Ridgway and Friedmann, 1946:338). Continuity in the range of *insignis* between El Real and the Comitan-Nenton Valley yet remains to be established.

Odontophorus guttatus. Spotted Partridge.—Hellmayr and Conover (1942:280) recognize the race *matudae* described by Brodkorb (1941:4) from southern Chiapas, but with some reservations. Racial characters given by them are broader width of white throat stripes and tear shape of breast spots. Brodkorb had but two specimens, Conover has examined but three, and the latter author points out that because of the individual variation displayed in this species, the above characters may not be valid bases for racial distinction. A series of ten first-year and adult specimens from Monte Libano (100 km. NE San Cristobal, 2500 ft.), Chiapas, collected December 1 to 4, 1945, bear out Conover's suspicion. There is such variation in form, size, and degree of black margination of ventral spots and also in width of throat stripes that I regard *matudae* as not

recognizable. This evidence is considered pertinent to the status of *matudae* in spite of the distance between Monte Libano and the geographic range ascribed to *matudae*, the vicinity of Escuintla (Hellmayr and Conover, 1942:281). Ridgway and Friedmann (1946:373) recognize no races in this species.

Cyrtonyx montezumae. Montezuma Quail.—Intergradation between *C. m. montezumae* and *C. m. sallei* in the southern part of the range of the former race is suggested by two specimens I have examined: A first-year male collected at Tres Marias (20 km. N Cuernavaca, 9800 ft.), Morelos, on January 30, 1945, departs from typical members of *montezumae* in the presence of varying amounts of chestnut on the posteriormost flank feathers. Its dorsal coloration is warmer and browner than that of any other specimen of *montezumae* examined, but there is no suggestion of *sallei* in dorsal patterning. Such is clearly present, however, in the second specimen, a first-year male collected 8 kilometers southwest of Rio Frio, 8900 feet, Estado de Mexico, on January 13, 1945. The shaft streaks of back feathers are a warm buff with or without black borders, the ground color is olive-buff, and the transverse, more or less oval spots appear in a row on either side of each shaft streak. In typical *montezumae*, however, the light buff shaft streaks are consistently black bordered and contrast with transverse black bars and lines on a reddish brown or grayish brown ground color. Thus, dorsal patterning of the specimen from Rio Frio is more similar to that of *sallei* than that of *montezumae*; but dorsal coloration is unlike either, although the general impression provided by color is perhaps closer to *montezumae* than to *sallei*.

Late breeding of this species in the highlands of Sinaloa is indicated by the record of a family group of two adults and at least three or four more than half-grown young observed on October 16, 1946, at El Batel (70 km. NE Mazatlan, 5100 ft.). Only the male was collected (left testis, 5 mm.).

Rallus limicola limicola. Virginia Rail.—A specimen of doubtful sex was taken at Alpuenca (25 km. S Cuernavaca, 3000 ft.), Morelos, on January 17, 1946.

Charadrius vociferus vociferus. Killdeer.—This species, lacking from previous lists of Guerreran birds, is represented in the Ray Collection by a female collected on February 20, 1940, at Chilpancingo.

Eupoda montana. Mountain Plover.—No previous records from Coahuila are known to me. One female was collected at Hipolito (50 km. NW Saltillo, 5000 ft.), on February 23, 1946.

Tringa solitaria. Solitary Sandpiper.—A female collected at Cuapongo, Guerrero, on August 15, 1939, represents the race *cinnamomea* on the basis of characters of both color and size (wing, 136.0 mm.). I find no previous report of this species from that state.

Totanus melanoleucus. Greater Yellow-legs.—This species, in Sonora, is considered by van Rossem (1945:81) as "probably a fairly common transient and winter visitant, although records are few and scattered." The earliest fall date given by him from a coastal locality is November 14. Greater Yellow-legs were noted daily and repeatedly, but in small numbers, from October 27 to November 4, 1946, on a laguna at Pitahaya, Sonora.

Actitis macularia. Spotted Sandpiper.—A series of four specimens was obtained at Chilpancingo, Guerrero, between the dates of October 12 (1940) and April 26 (1939). Davis (1944:10) reports three specimens taken in the late summer (August 9-13, 1942) while Griscom (1934:373) lists one taken in January. Evidently this species occurs in Guerrero as both migrant and winter resident.

Capella gallinago delicata. Wilson Snipe.—The Ray Collection contains a female

collected at Chilpancingo, Guerrero, on December 20, 1939. This species is not listed from that state by Griscom (1934) or more recent authors.

Recurvirostra americana. Avocet.—This species, in Sonora, is considered by van Rossem (1945:88) as a "transient and winter visitant of uncertain abundance." At Pitahaya, from October 27 to November 4, 1946, one flock of approximately 25 individuals as well as scattered individuals and small groups were seen daily.

Sterna albifrons. Least Tern.—Another species not previously reported from Guerrero is represented in the Ray Collection by a female collected at Acapulco on September 7, 1944, in a late stage of the postjuvenile molt. Presumably it represents the race *browni*.

Columba flavirostris. Red-billed Pigeon.—A series of 17 specimens from Texas, Mexico, and El Salvador sheds some light on the variation of this species in Mexico. According to van Rossem (1930:197) and Peters (1937:65), two races are found: *C. f. flavirostris* ranges northward through Mexico to southern Texas and southeastern Sonora; *C. f. restricta* occurs in southern Sonora and Sinaloa. *C. f. restricta* is said to be paler than the nominate race, with less red on under parts and more prominent grayish white margins on greater wing coverts. Among specimens examined in this study, only the characters of paler average coloration and ventrally reduced red coloration appear to be usable in distinguishing *restricta*. Individual variation is marked, and the magnitude of difference in average coloration is approximately comparable to that separating eastern and western races of *Zenaidura macroura*. Three adult males examined in this study together suggest a western pale race and are tentatively assigned to *restricta*: one from Sauta (12 km. S Santiago Ixcuintla, 150 ft.), Nayarit, April 18, 1946, and two from Poliutla, Guerrero, December 3, 1944. One of the latter two is ventrally the palest of specimens seen by me. These specimens would seem to bear out Hellmayr and Conover's (1942:452) postulation that the range of this race extends south beyond Nayarit. Summer occurrence of "*Columba flavirostris flavirostris*" in Guerrero has recently been recorded by Davis (1944:10).

It remains doubtful whether or not the character of more prominent white wing-covert margins actually serves in separating *restricta* from *flavirostris*. Again considerable individual variation occurs in this character among specimens seen by me. While the three specimens assigned to *restricta* do show more white wing-covert margining than most specimens of *flavirostris* from northeastern Mexico, they do not show nearly as much white as two from the southern part of the range of the nominate race: an adult female, San Juan, Campeche, November 23, 1945, and an adult male, Xocempich, Yucatan, November 7, 1945. Degree of wear is undoubtedly a factor in the prominence of this character; both of the specimens just cited are incompletely or recently molted, and an immature male collected at La Union, Nuevo Leon, on July 24, 1945, shows newly grown greater wing coverts with striking white margins.

Van Rossem (1930:197) notes that according to Ridgway's (1916:301) figures, birds from Texas average the largest in this species. This fact is borne out by data on wing length of adult males I have examined, as follows:

Texas, Tamaulipas, Nuevo Leon	205, 204, 200 (worn), 200 (worn), 197, 194 mm.
Nayarit, Guerrero, Vera Cruz, Yucatan	196, 196, 194, 193, 192, 192 mm.
El Salvador	187 mm.

Zenaidura macroura. Mourning Dove.—A large series of specimens from Guerrero and Oaxaca clearly indicates that populations occurring in these states do not represent the race *marginella* alone, as maintained by Ridgway (1916:349) and Peters (1937:83), but represent, in the majority of specimens, another race that is smaller and darker.

Occurrence of both breeding and wintering populations of this species in southern Mexico complicates any effort to analyze racial distribution.

Information on the breeding distribution of the Mourning Dove in southern Mexico is scanty. It supposedly breeds in Oaxaca, according to Ridgway (*loc. cit.*), and this is confirmed by four specimens from that state collected by A. S. Leopold, as follows: a male (testis 14 mm.), 6 kilometers east of Tamazulapam (6600 ft.), September 5, 1945; a male (testis 9.5 mm.) and two females (largest ova 1.5 and 4.5 mm., respectively), all from Tlacolula (5000 ft.), September 7, 1945. The dates appear to be too early for migrants from the north, and condition of gonads indicates that these specimens were obtained probably toward the end or just after the nesting season. Nesting of *Zenaidura macroura* in Guerrero, however, is apparently not known. Ridgway (*loc. cit.*) does not include that state in his statement of the breeding range, and Griscom (1934:372) lists four specimens taken at Chilpancingo in the period from October 27 to January 5. The Ray Collection contains 28 specimens from the same state representing all months except May, June, August, and September. Three of these specimens, all from Chilpancingo, were collected in April and July: female ("ovary slightly enlarged"; wing, 134 mm.), April 11, 1943; female ("ovary slightly enlarged"; wing, 140 mm.), April 12, 1944; and female ("ovary minute"; primaries undergoing molt), July 16, 1944. The latter specimens suggest the possibility that the species may breed in Guerrero, presumably at elevations above that of Chilpancingo.

In spite of the present uncertainty concerning the actual breeding range of *Z. macroura* in southern Mexico, it is possible to say that most of the specimens from Oaxaca and Guerrero examined in this study do not belong to the race *marginella*. They are clearly darker, and also smaller (see table 2), than specimens of *marginella* from southwestern United States and northwestern Mexico. The former thus suggest *Z. m. carolinensis*. Among the 36 specimens from Guerrero and Oaxaca, there are but seven actual or possible breeding specimens, already cited. The remaining 29 were obtained at times other than the presumed period of breeding and may represent, in the main, migrants and wintering birds, those from Guerrero perhaps entirely so. The probable occurrence of *Z. m. carolinensis* as a winter resident in Oaxaca and Guerrero is suggested by recently published banding data. Ridgway (1916:346) considered *carolinensis* to be a migrant along only the gulf coast of Mexico, but its presence in the interior of Mexico has been demonstrated by records of McClure (1943:407), who reports recoveries of Iowan doves in Nayarit, Jalisco, and Distrito Federal, and also in El Salvador. Two specimens collected in Michoacan on February 21, 1945, at Quiroga (6800 ft.), resemble the Guerreran and Oaxacan birds in color and thus also suggest *Z. m. carolinensis*. I do not find any breeding records of *Z. macroura* from Michoacan. McClure (letter, March 29, 1948) reports a recovery of an Iowan dove from Curimeo, Michoacan.

The western race, *Z. m. marginella*, however, does occur as a winter resident at least as far south as Guerrero. Two, not included in the total of 36 mentioned above or in table 2, collected at Chilpancingo, are here assigned to *marginella*: a male (wing, 157 mm.) taken on February 17, 1944, and a female (wing, 149 mm.) taken on November 27, 1944. Color characters of these specimens fall within the range of variation of both *carolinensis* and *marginella*.

In summary, it is shown that specimens from Guerrero and Oaxaca, which represent a breeding population in part in the latter of these two states, are distinguishable from *Z. m. marginella* by smaller size and darker coloration and are indistinguishable from *Z. m. carolinensis*. The latter race occurs in the winter in central Mexico and southward; also, most of the specimens were obtained in winter and periods of migration. These

facts suggest that the majority of Guerreran and Oaxacan specimens represent wintering individuals of *carolinensis*. *Z. m. marginella* also occurs in Guerrero as a winter resident. *Z. macroura* is not known to breed in Guerrero, but there is some indication that it may do so. Foregoing data also suggest the possibility of a geographically separated population in southern Mexico that is racially indistinct from *carolinensis*; in this connection, a reexamination of breeding specimens from eastern Mexico is necessary.

Table 2
Wing Length in Three Populations of *Zenaidura macroura*

	Number of specimens	Mean with standard error	Standard deviation
Southern California, Northeastern Baja California, Nevada, Sonora, and Durango (<i>Z. m. marginella</i>)			
Males	20	148.9±0.7 mm.	2.94
Females	15	142.9±0.7	2.59
Guerrero and Oaxaca (<i>Z. m. subspecies?</i>)			
Males	17	143.9±0.7 mm.	2.76
Females	13	139.7±0.8	2.80
Ontario, New York, Michigan, Georgia, South Carolina, Wisconsin, and Missouri (<i>Z. m. carolinensis</i>)			
Males	11	143.3±1.1 mm.	3.44
Females	6	139.2±1.8	3.97

Zenaida asiatica. White-winged Dove.—Thirty-seven specimens from various parts of Mexico and adjoining parts of Texas, New Mexico, and Arizona have been examined in the light of distinctions between the races *Z. a. asiatica* and *Z. a. mearnsi* provided by Ridgway (1916:379, 383). Ridgway included Nuevo Leon and San Luis Potosi in the range of the western race (*mearnsi*), but this is now regarded as erroneous in view of the geographic gap, the northern part of the Mexican plateau, separating northern populations of the two races. Thus, Peters (1937:87) and Hellmayr and Conover (1942:500) restrict *mearnsi* to western Mexico and adjoining parts of the United States.

These authors, however, also extend the range of *mearnsi* southward and eastward to Puebla, and this I regard as open to question. Geographic relations of the two races would lead one to expect intergradation between them to occur to the south of the central plateau. This is corroborated by data from the series examined in this study. Thus, populations in the southern Mexican states east of the gulf-coast lowlands and Oaxaca are more or less intermediate in size between *asiatica* and *mearnsi*. Wing lengths of fifteen specimens from Guerrero are as follows:

Males	166, 165, 162, 161, 159, 158, 155 mm.
Females	164, 163, 160, 157, 156, 154, 153, 148 mm.

The averages, 160.8 and 156.8 mm., respectively, are below those given by Ridgway (*loc. cit.*) for *mearnsi*, but are closer to *mearnsi* than to *asiatica*. Two specimens obtained to the west of Puebla, however, appear to represent *asiatica*: a male (wing, 152 mm.), taken at Lake Rodeo, Morelos, on January 26, 1945, and a male (wing, 150 mm., tip slightly worn), taken at Pedrigal (5 km. S Mexico City, 7900 ft.), Distrito Federal, on July 31, 1943. In both of these specimens wing length is below the average (156.3 mm.) given by Ridgway for the race *asiatica* rather than the reverse, as might be expected from the range statements of Peters and of Hellmayr and Conover. Average color differences between the two races are slight and difficult to appraise; southern Mexican

specimens, however, appear to be more or less intermediate and probably average closer to *asiatica* than to *mearnsi*.

A male taken along the east slopes of the Sierra Madre Oriental at Santa Domingo, 4500 feet, San Luis Potosi, on September 27, 1945, measures 165 mm. in wing length (to the tip of the third developed primary; the second is not fully grown). At present it seems best to regard this specimen as a large variant of *Z. a. asiatica*.

For Sonora (van Rossem, 1945:99), late fall or winter records north of latitude 29° are lacking, although the species is known to winter in southern Arizona in small numbers. A loose flock of approximately 25 individuals was observed in flight over bottom-land timber of poplar and willow just south of Casita (40 km. S Nogales, 3300 ft.), on November 9, 1946.

Leptotila verreauxi. White-fronted Dove.—Guerreran specimens of this species are assigned by recent authors to *L. v. angelica* [= *brachyptera*], and seven specimens examined in this study are so placed. Characters of these specimens display an approach toward *fulviventris*, however, as vinaceous coloration of the breast and buffiness of posterior under parts both average somewhat darker than in typical *angelica* to the north. One specimen, an adult male collected 10 kilometers south of Atoyac, Guerrero, on December 12, 1944, is as richly buffy ventrally as typical *fulviventris* and represents an extreme in the entire series of *angelica* available to me.

Leptotila jamaicensis. Jamaican Dove.—This species, represented by the race *gaumeri*, is known on the Mexican mainland only in the northern part of the Yucatan Peninsula (Hellmayr and Conover, 1942:566). An adult male was obtained at San Juan, Campeche, on November 24, 1945.

Leptotila cassinii. Cassin Dove.—The known occurrence of this species within Mexico is apparently limited to southern Chiapas (Hellmayr and Conover, 1942:567). Four specimens were obtained well to the northeast of this locality, at Monte Libano (100 km. NE San Cristobal, 2500 ft.), Chiapas, December 1-5, 1945. Presumably they represent the race *cerviniventris*. It may be noted that this range extension is similar to that described under *Colinus virginianus insignis*.

Oreopelia albigularis rubida. White-faced Quail-dove.—Among 11 specimens in the Ray Collection from Cuapongo and Omilteme, Guerrero, two provide breeding data: a male collected at the latter locality on July 16, 1945, with "testes fully enlarged" and a well-grown juvenal female from the same locality collected on August 12, 1943.

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THE SUMMER BIRD LIFE OF ATTU

By ROWLAND STEELE WILSON

In a paper by Sutton and myself (1946) I already have published most of my observations on the winter bird life of Attu Island, in the Aleutian Chain, but I have not reported on the summer birds. Since I was stationed on the island for more than a year (September, 1944, to October, 1945), I experienced one full summer there from beginning to end. I could not get into the field much in this period, but I was so situated as to be able to reach certain stretches of ocean shore without trouble and to visit the great rocks at the tip of Murder Point, the several small tundra ponds west of Casco Cove, the broad valleys of small streams which flowed into Massacre Bay, the cliffs which rose abruptly from the sea along a stretch of shore northwest of Alexai Point, and the broad, dark beach at Alexai Point itself (see Sutton and Wilson, 1946:84, map). Visiting more distant points, such as Temnac Bay, Temnac River, and Alexai Pass necessitated cross-country hikes. Holtz Bay, Red Beach, Chichagoff Harbor, Fishhook Ridge, and other places along the north shore I visited infrequently in connection with Navy assignments.

Attu is young, geologically speaking. Unlike certain other islands of the Chain it has no active volcano. Raised beaches, which have resulted from comparatively recent up-thrusts of the land-mass, are to be seen one-quarter of a mile inland in Temnac Valley on the south shore, and at Steller's Cove on the north shore. Beaches at the seaward end of the long valleys are usually of dun-colored sand; the sand of Temnac Beach, however, is basaltic and black. Along almost the entire coast steep mountains rise abruptly a short way back from shore, some of them attaining a height of 3500 feet. The peaks and narrow, knife-sharp ridges are rugged and usually bare. The most extensive stretch of level terrain is at the island's east end. Here even the highest ridges do not rise to much over 2500 feet, and four broad valley systems fan out to the north, east and south from the central area of Jarmin Pass (between Massacre Bay and Holtz Bay) and Clevesy Pass (between Massacre Bay and the Chichagoff-Sarana Bay Sector). Swift streams flush these valleys, pouring into and draining freshwater lakes within half a mile of the sea.

The fall of 1944 was almost continuously overcast. Rifts in the clouds occasionally permitted the sun to break through, but only about once in a fortnight did we have a day which was bright from sunrise to sunset. Early in September the temperature began to go down. By September 12 snow lightly covered the mountain peaks and higher ridges. The snowline marched steadily down the slopes until, by December 10, there was a substantial blanket over the lowlands. Eventually this reached a depth of five feet half a mile back from the coast of Massacre Bay, and of more than thirty feet in valleys a mile inland. The outer beaches were so lashed by the wind, however, that the snow rarely attained a depth of more than a few inches there, and tall dead grass which stuck up in rough clumps almost at the waters' edge (when the tide was in) did not become flattened and snow-buried until midwinter. These clumps of grass continued to be the only places, aside from openings under rocks, in which such birds as Song Sparrows could find shelter.

After the raw, windy, and a stormy winter, clear days did not become more frequent as the season advanced. Indeed, they were less frequent in April and May than they had been in December and January. As the temperature rose and the days grew longer, the overcast became more and more persistent. When the chirps of the newly arrived Lapland Longspurs announced the winter's passing, horizon and contour lines had all but disappeared in the heavy fog and drizzle.

The spring breakup came about April 20. With incredible swiftness the snow disappeared from the lowlands, as an intricate network of rivulets and hundreds of tiny

shallow ponds came into being all over the tundra. Scarcely had the ground become brown when it turned green with upspringing grasses. Gayest of all were the lush emerald mats of wild rye (*Elymus arenarius*) which marked the upper limits of the beaches and the lichens (*Calloplaca elegans*) which spotted the rocks with bright red-orange. As the lower slopes became wholly free of snow, their brown tones brightened, and the edges of the rocks lost their sharpness as tiny filaments of moss lifted and spread.

On May 2 I found the first flower of spring—a reddish purple blossom of the crowberry (*Empetrum nigrum*). But the height of the flowering season came in July and August. In August we had stretches of fine weather. More sun appeared. The cloud cover thinned and temperatures averaged 52° F., with the thermometer sometimes up to 70° F.

In August and early September fruit matured on the Siberian mountain ash (*Sorbus sambucifolia*), crowberry, dwarf dogwoods (*Cornus canadensis* and *C. suecica*), bilberry (*Vaccinium uliginosum*), and cranberry (*Vaccinium vitisidaea*). Many of these fruits were important bird foods. By September 12, when snow again whitened the peaks, the flowers all were gone and brownness had returned to the tundra.

The following list of birds probably includes most of the species which breed on Attu, as well as a few, such as *Philacte canagica*, which winter there but do not nest. Certain species, such as *Uria lomvia* and *Synthliboramphus antiquus*, which probably breed on or near Attu, were not seen with certainty. Two species, *Diomedea nigripes* and *Oceanodroma leucorhoa*, I saw only in the Bering Sea north of the Aleutian Chain and east of Attu.

For the names of plants in the following list I am indebted to George B. Van Schaack.

Diomedea nigripes. Black-footed Albatross. On an eastbound voyage north of the Aleutian Chain I saw the Black-footed Albatross almost constantly from September 30 to October 2, 1945, inclusive. On those three days from five to forty birds followed our vessel throughout the daylight hours, and perhaps at night also, snatching ship's refuse from our wake. The species first appeared at a point north of Amchitka Island (179° W, 54° N) and was last seen at Unimak Pass (163° 30' W, 55° N). I did not see the species anywhere beyond Unimak Pass, in the North Pacific, or in Shelikoff Straits north of Kodiak Island.

Oceanodroma leucorhoa. Leach Petrel. On an eastbound voyage north of the Aleutian Chain I saw this petrel almost constantly from September 30 to October 2, 1945, inclusive. With the Black-footed Albatross, it first appeared at a point north of Amchitka Island, and I saw it as far east as Unimak Pass. I never saw more than ten birds at one time, nor fewer than five. They kept closer to the water than the Black-footed Albatrosses as they glided above the waves.

Phalacrocorax pelagicus. Pelagic Cormorant. I saw this species almost daily throughout the summer, especially in Casco Cove and Massacre Bay. So far as I could determine, its favorite feeding- and resting-grounds were the very ones which it had used all winter long (Sutton and Wilson, 1946:85-86). Often I saw a considerable company standing quietly, or preening in leisurely fashion, on low-lying rocks offshore. Single birds, pairs, or small companies fished regularly in deeper waters near the piers and breakwaters.

A sizeable colony bred on a huge, bold-faced rock which towered 70 feet above the sea on the island's north shore 200 yards east of Red Beach and just to the west of Holtz Bay. When I visited this colony on August 5, I counted 55 adult birds on the rock's south, southeast and west faces and saw many more flying along the north face. The birds clamped their tails tightly against the rock for support when perching in small niches or on narrow ledges. In several nests I saw young birds which appeared to be about half grown.

Philacte canagica. Emperor Goose. This goose is a familiar bird along certain stretches of shore in winter, but it does not summer on or about the island. I saw a newly arrived flock of 20 birds at Red Beach, west of Holtz Bay (on the north shore), December 2, 1944. At Massacre Bay, on the south shore, the species arrived *en masse* on December 20. From that date on I saw flocks numbering from 4 or 5 to 30 birds almost daily throughout the winter, from Alexai Point westward along the entire Massacre Bay shore as far as Murder Point. Often the flocks fed within 50 yards of the much travelled beach-

road, making their way from feeding ground to feeding ground in short flights during which they rarely rose more than a hundred feet in the air. After April 1 the flocks became smaller and the birds tended to frequent the rocks offshore rather than the beach proper, but I noted nothing which I considered courtship or pairing. On April 20 I watched a flock of 12 fly westward past Murder Point and Temnac Point to rocks about a hundred yards offshore in Temnac Bay. Here they tarried and fed; none was seen thereafter.

Anas platyrhynchos. Mallard. I frequently observed this species in the summer, principally in the valley of the Temnac River, along the shore of Massacre Bay, and in Holtz Bay. I first saw it on May 10, in the vicinity of Temnac Bay. Some of the 20 birds (12 males, 8 females) that day obviously were paired, but groups each composed of three or four males and one female idled in the salt water near shore, or made their way up the Temnac River to shallow marshes or tundra ponds. The Temnac valley must have been a favorite nesting ground of the species, though I failed to discover a nest or brood of young there. Characteristic plants of the valley were the tundra sedges *Deschampsia berigensis* and *Tofieldia coccinea*, cotton grass (*Eriophorum medium*), cloudberry (*Rubus chamaemorus*), and alpine timothy (*Phleum alpinum*). In the sphagnum bogs grew the tiny sundew (*Drosera rotundifolia*) and, in the shallow pools, pond lilies (*Nuphar polysepala*).

The last Mallards were noted on August 28: two males and three females flew low over the west arm of Holtz Bay.

Anas acuta. Pintail. I encountered the Pintail only in the valley of the Temnac River. Here there was one pair on May 10, and three pairs on various occasions between May 21 and August 12. These three pairs almost certainly bred in the vicinity, although I did not find the nests or young birds.

Anas falcata. Falcated Teal. On May 23 and 24, 1945, Lt. E. L. Stone and I observed a male and female of this handsome species, together with two male and two female Tufted Ducks and three male and four female Greater Scaups, on a little "pothole" pond inland from Murder Point. We had abundant opportunity to watch the teals, for they were not shy. On the 24th we saw the male diving several times. He went under rather awkwardly, giving us the impression that he was not used to such activity. The female did not dive while we watched her. Most of the time the birds idled side by side, apart from the rest of the flock, with heads down against their backs. They appeared to be content merely with resting. Possibly they had been blown in from the west by a recent storm. Although they continued to stay close to each other, we were not sure that they were paired, and we obtained no evidence whatever that they nested in the vicinity. Indeed we neither saw them nor heard of them again after May 24.

The tundra about the pond was meadowlike, the vegetation having an admixture of so-called "heath-tundra" plants. Van Schaak collected in the immediate vicinity *Festuca rubra*, *Poa arctica*, *Pedicularis chamissonis*, *Linnaea borealis*; and, in swampy ground not far removed, *Hierochloa odorata*, *Lathyrus palustris*, *Potentilla palustris*, and *Chinanthus borealis*. So far as we could see, the ducks were not seeking any of these plants as food. If they were feeding at all, they must have been doing so on the bottom of the pond, which was only three or four feet deep.

Apparently this Siberian species has been recorded in North America only once previously. A male was secured on St. George Island in the Pribilofs on April 18, 1917 (Hanna, 1920:250).

Anas crecca. European Teal. An adult male European Green-wing frequented the ponds and puddles inland from Murder Point on May 22, 23 and 24. E. L. Stone and I noted it repeatedly on those dates, not only as it rested in the water but also as it flew from place to place.

Aythya marila. Greater Scaup Duck. This winter resident species I recorded frequently from October 5, 1944, to June 1, 1945, principally in salt water but occasionally on one of the larger tundra ponds. Casco Cove and the waters just to the east of Murder Point were its favorite feeding grounds. Here, during the dead of winter, I sometimes saw as many as 20 birds swimming just out from shore or walking along the beach looking for food. On May 23 and 24, as above noted, I saw three male and four female Greater Scaups with Falcated Teals and Tufted Ducks on a pond inland from Murder Point. On June 1, the last date on which the species was recorded, I saw four males and six females placidly swimming about together near shore at the western edge of Casco Cove.

Aythya fuligula. Tufted Duck. Two male and two female Tufted Ducks lingered in the little "pothole" pond inland from Murder Point on May 23 and 24, 1945, as already noted. Here E. L. Stone and I watched them for some time, noting carefully the tuft of long, loose feathers which streamed

down from the nape of each male. There was enough stiffness in these tufts to permit them to fly independently of the rest of the head plumage, yet their curvature was about the same as that of the nape and neck. The four birds dived easily and frequently. They tended to keep in a group by themselves, apart from the scaups and the teals.

The Tufted Duck apparently has not heretofore been recorded in the Aleutian Islands. Collins, Clark and Walker do not list it in their paper (1945). It has been taken once on St. Paul Island in the Pribilofs (Evermann, 1913:17) and is said to be casual in Greenland (A.O.U. Check-list, 1931:52).

Glaucionetta clangula. Common Golden-eye. This species was noted repeatedly from October 20, 1944, to April 10, 1945. I usually saw it in flocks, some of which became so tame that they would not dive nor fly even while automotive traffic was passing noisily on the beach-road only 20 yards away. In February and early April one flock of about 15 birds was composed wholly of males (Sutton and Wilson, 1946:86), but mixed flocks which I saw between April 6 and 10 were composed of 6 to 10 males and 5 to 8 females. I did not observe courtship activity during their period.

Histrionicus histrionicus. Harlequin Duck. Clark's statement (Collins, Clark and Walker, 1945:41) that this duck "is abundant in small flocks everywhere—about rocky shores, exposed reefs, and gravelly banks—and individually or in pairs on inland streams" might lead one to believe that it nests commonly throughout the Aleutians, but I certainly did not see it on Attu in the summer of 1945. The preceding fall it appeared on November 10 and I saw small flocks repeatedly all winter in Holtz, Massacre and Temnac bays. The winter-long population of the southeast end of the island was, I believe, about a hundred birds, some of which regularly shared certain seaweed-covered rocks with Eiders in Casco Cove. I last saw the species in scattered pairs in Casco Cove, on April 4.

Somateria mollissima. Eider. This resident species probably nests in suitable places along the whole of Attu's shore. During the period of egg-laying and incubation the females are not much in evidence, but the males, which idle on offshore rocks or in shallow water along the shore, are very conspicuous. On May 22, 1945, I saw a flock of about 40 males in the middle of Casco Cove. At that time the females were on rocky islets 100 to 300 yards offshore, sitting on their nests. On several occasions in mid-July I saw females with broods of small young. These broods seemed to spend much of their time in the water, but occasionally they walked after their mother on shore, nibbling at the sand.

Lagopus rupestris. Rock Ptarmigan. The Rock Ptarmigan probably does not leave the rugged mountain slopes of the interior in summer. Indeed, I have never seen it or its tracks anywhere along the coast, even in the dead of winter. A male bird which Robert E. Ellis and I observed as we were crossing Fishhook Ridge, between Holtz Bay and Chichagoff Harbor, on June 10, 1945, appeared to be in full summer plumage. It was gray except for the white of the wings. On July 12, 1945, I saw a pair, in full summer plumage apparently, at an elevation of about 1200 feet on the west shoulder of Terrible Mountain (Mt. Buckner), inland from the head of Massacre Bay. On July 28 R. E. Ellis and I encountered a male and two females high on the steep mountain just southwest of Casco Cove (see map, Sutton and Wilson, 1946:84). When we first saw the birds they were walking slowly ahead of us. Suddenly they whirled upward cackling, set their wings, and, following the contours closely, glided slightly down-slope across the mountain.

Erolia ptilocnemis. Rock Sandpiper. I saw this bird the year round, especially on the rocky shores of Massacre Bay, in small flocks in winter and along the same rocky shores, about certain fresh water ponds, and on the comparatively dry tundra in pairs, during summer. On the sandy beaches of Temnac, Sarana and Holtz bays I did not once see it. Along the rocky south shore of Sugarloaf "Island," in Massacre Bay, I saw a few birds each time I visited the place throughout the entire year, but I am not sure that they nested there.

On September 12, 1944, a solitary bird scurried along the edge of a small pond at Alexai Pass, at an elevation of about 1000 feet, north of Alexai Point and fully a mile from the nearest salt water. Here vegetation was sparse, characteristic plants being the *Sibbaldia* (*Sibbaldia procumbens*), the sandwort (*Minuartia biflora*), the downy oat-grass (*Trisetum spicatum*) and a lichen, *Solorina crocea*.

Larus glaucescens. Glaucous-winged Gull. In summer I occasionally saw these gulls at various points about the eastern half of the island. I did not find a nesting colony, however, and I made a point of ascertaining that no Glaucous-winged Gulls preyed regularly on the Tufted Puffin colony on Sugarloaf "Island" in Massacre Bay.

Sterna paradisaea. Arctic Tern. I saw this species occasionally throughout the summer, always singly or in small groups or pairs, never in large flocks, principally on the ocean shore. It was first

recorded along the south side of Sugarloaf "Island" where, on June 22, I counted four birds (probably two pairs) flying back and forth along the tidal flats. Presently the birds made their way up freshwater streams into Peaceful Valley. Here, plunging into the water from heights of 12 to 18 feet, and sometimes disappearing completely beneath the surface, they foraged not far from the heavily populated military area. On June 25, I saw six birds, probably three pairs, along a stretch of beach just south of Sugarloaf "Island." In late June and throughout July I repeatedly saw the species along the beach at Temnac Bay. It was last seen on August 26.

Lunda cirrhata. Tufted Puffin. The officers of certain coastal patrol boats reported seeing scattered sea parrots some 10 miles south and east of Attu on April 19. Shortly thereafter the birds made their way in to their breeding grounds proper. Those which I saw on May 5 in Massacre Bay were standing here and there on the top and sides of Sugarloaf "Island" or were swimming in dense rafts offshore. A colony of about 2300 birds nested here. To the best of my knowledge this was the only colony on the eastern half of Attu (as far west as Steller Cove on the north shore and Etienne Bay on the south shore), although in June and July I saw a few single birds and small flocks (up to 12 birds) in flight at Holtz Bay and Chichagoff Harbor. The latest date on which I saw a large raft of birds in the vicinity of Sugarloaf was July 15. Although I did not record the species anywhere after August 25, I can hardly believe that it left Attu entirely at that time. All adult birds which I saw from April 19 to August 25 appeared to be in full breeding dress. The 200 birds which I saw near Sugarloaf on August 25 still were wearing bizarre head tufts, which bore an unexpected resemblance to bunches of corn silk blowing in the wind.

Sugarloaf is a rocky, turf-covered hummock about 50 feet high, 75 feet wide and 100 feet long which occupies the tip of a flat, low, narrow, 16-acre peninsula or spit, jutting out from the west shore of Massacre Bay. The top of the hummock is thickly grown with rye grass (*Elymus mollis*). To its steep seaward sides cling masses of saxifrage (*Saxifraga bracteata*) and draba (*Draba hyperborea*). All over the flat ground at its base flourish such shore plants as the alpine cress (*Cardamine umbellata*), large-leaved avens (*Geum macrophyllum*), starwort (*Stellaria crispa*) and Eskimo potato (*Fritillaria camschatcensis*). The puffins nested in burrows in the turf on the hummock's sides. The colony probably had inhabited the spot for years, for I found many burrows in November, 1944, before the first heavy snows, and in April, 1945, immediately after the snow had melted. A midden at the base near the landward end bore testimony to the one time existence of a tiny settlement of Aleuts which probably subsisted to some extent on puffins in summer.

When I visited Sugarloaf on May 5, I counted 98 puffins on the hummock's sides and saw three dense rafts in the water about 200 yards offshore. In the largest of these, to the east, I estimated that there were 1000 birds. That to the north was about half as large. In that to the south there were about 750 birds. As I clambered about among the rye grass, puffins seemed to be everywhere about me. Some were standing statuesquely on slopes at safe distance. Others eyed me furtively from the entrances of their burrows. Still others, frightened when I approached within 20 feet, scuttled underground or, leaping into the air on rapidly beating wings, took off for sea. Departing birds spread their vermilion feet stiffly behind them until, having got well under way, they folded their webbed toes and drew them neatly up against their tails. Despite the beating of their wings they descended rapidly. They could not seem to work up sufficient speed for sustained flight until they were within a few feet of the water or the tidal flats. Flying low above the water required no maneuvering; but across the flats they had to steer a zigzag course among the rocks, and sometimes they crashed into a boulder, fell to the ground, picked themselves up awkwardly, ran on their stubby feet for 15 or 20 feet, and once more, with wings beating rapidly, managed to get into the air again.

Puffins came in from sea both singly and in small flocks. In returning, they usually circled the hummock once, then made a "stall landing" in which they dropped on to the turf with about the same abruptness and abandonment they displayed in alighting in water. In rising from the water they were obliged to skip or run on the surface for thirty feet or more before getting under way.

Corvus corax. Holarctic Raven. In summer the raven population scattered widely along the coast and throughout the rugged interior, its distribution at that season coinciding with that of cliffs suitable for nesting. On July 20 I found a nest which was placed in a niche on the seaward face of a cliff about one and a half miles west of Murder Point. The cliff rose abruptly from a narrow strip of tundra fifty feet back from the rocky beach. Soil had gathered in its numerous fissures and pockets and here grasses grew in abundance. The nest was about 16 feet up from the base of the cliff. In it were four half grown

young. One of the parent birds dived at me repeatedly while I was at the nest, dropping to within five feet of my head while I was handling the young.

Troglodytes troglodytes. Winter Wren. This wren was seen the year round, in winter about large boulders, rock piles and grass-covered hummocks along the outer shore, in summer along the beaches as well as at lower elevations inland. Even in winter I often saw what I believed to be paired birds. On June 20 and 24 I encountered a single bird near three large rocks not far from the raven's nest described above. The wren appeared to be feeding here, though I did not see it carrying food to its young, nor did I hear it singing. Much of the time, while I was following it about, it stayed under the rocks; but occasionally it flitted from one to another, or, chattering loudly, hopped to the very top of the highest, then scampered or flew down to the beach and hid again.

Leucosticte tephrocotis. Gray-crowned Rosy Finch. I saw this species repeatedly throughout the winter, but feel sure that it withdraws to the rugged interior of the island to nest. My only summer record is of a single bird which I observed on June 10 as it flitted among the rocks at the eastern edge of the east arm of Holtz Bay.

Melospiza melodia. Song Sparrow. I saw this species the year round, usually in pairs, occasionally singly, never in a flock. Almost daily I encountered it in the vicinity of the military installations along the shore of Massacre Bay and also well inland on the tundra, in Peaceful Valley and Massacre Valley. Somewhat to my surprise I recorded it about Holtz Bay, Chichagoff Harbor, Sarana Bay and Temnac Bay. On the afternoon of August 10, when I was at about 2800 feet elevation near the top of a pinnacle at the head of O'Donnell Valley, and when, because of the dense fog, I could see but 50 feet in any direction, I heard the familiar chip of a Song Sparrow and presently saw one hopping about the scree searching for food among the moss, lichens, and pebbles. This was the highest elevation at which I actually saw or heard the species.

Calcarius lapponicus. Lapland Longspur. This species evidently leaves Attu wholly in winter. On May 2, 1945, about twenty birds (males and females) must have arrived more or less simultaneously in the Massacre Bay district. On that date I saw several brightly colored males giving flight songs in Peaceful Valley and in the passes leading across to the valley of the Temnac River. Throughout lower parts (below 1500 feet elevation) of the eastern half of the island, the species nested commonly. Characteristic plants of its habitat were the lousewort (*Pedicularis chamissonis*), cowslip-leaved avens (*Geum calthifolium*), Indian paint-cup (*Castilleja unalaschensis*), willow (*Salix arctica*), and various grasses, mosses and lichens. I last recorded the species on August 30.

Plectrophenax nivalis. Snow Bunting. On September 10, 1944, I saw a flock of fifteen Snow Buntings in fresh winter plumage on Gilbert Ridge, just west of Alexai Pass. Throughout the following winter months I noted Snow Buntings occasionally. In April the species became noticeably more common in Peaceful Valley. On May 3 there were several males and females in the passes connecting Peaceful and Temnac valleys. Most of these birds were paired but a few still were going about in small flocks. In June several pairs were on the lower slopes of Terrible Mountain and on Fishhook Ridge near the north coast of the island. In July and August I encountered pairs and family groups in Massacre Valley and in the vicinity of Chichagoff Harbor, Sarana Bay and Holtz Bay.

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JUVENAL HORNED LARK, *EREMOPHILA ALPESTRIS MERRILLI*

A Sketch by Allan Brooks

FROM FIELD AND STUDY

Raptorial Hosts of *Protocalliphora*.—Recently Work and Hill (Condor, 49, 1947:74-75) reported larvae of *Protocalliphora* parasitizing the Sparrow Hawk (*Falco sparverius*) and the Golden Eagle (*Aquila chrysaetos*). It was stated in that report that no mention of any raptorial birds as hosts for these flies had been found in the ornithological literature. Since then several references to raptorial hosts have been uncovered, but none of these mentions either the Sparrow Hawk or the Golden Eagle. The earlier references are as follows: Burtch (Auk, 37, 1920:293) reports removal of maggots from the ears of three seventeen-day old Cooper Hawks (*Accipiter cooperii*) in New York. He suggests that the maggots may have been screwworm fly larvae (*Comptosia macellaria*). However, according to Hall (The Blowflies of North America, 1948:137) this name is an old synonym for *Callitroga americana*, the screwworm fly which is the common cause of myiasis in domestic and wild animals and known to be entirely parasitic on mammals. Hence, it is probable that Burtch was dealing instead with bird nest screwworm fly larvae (*Protocalliphora*). Sargent (Auk, 55, 1938:82-84) found *Protocalliphora* larvae "in great numbers" in the nests of Red-tailed Hawks (*Buteo jamaicensis*), Red-shouldered Hawks (*Buteo lineatus*), and Cooper Hawks (*Accipiter cooperii*), in New York. They were commonly found in the ear canals of the two species of *Buteo*, but never in the ears of the Cooper Hawks. Shannon and Dobrosky (Jour. Wash. Acad. Sci., 14, 1924:250) report a nest of the Long-eared Owl (*Asio otus*) parasitized at McElroy Lake, Paha, Washington.

I communicated recently with C. F. W. Muesebeck, Division of Insect Identification, Bureau of Entomology and Plant Quarantine, U. S. Department of Agriculture, in regard to published records of raptorial hosts for *Protocalliphora*. He was able to find no references further than those mentioned above, excepting Hall's monograph on the blowflies (*op. cit.*). This work, which has just been published, lists the three species of hawks and the one owl mentioned above and, in addition, the Swainson Hawk (*Buteo swainsoni*). It has not been possible to account for the original source of the record of the Swainson Hawk.

According to Hall (*op. cit.*), North American blowflies which have been referred to as *Protocalliphora* are now correctly referred to the genus *Apaulina* (new genus) and given the common name of bird nest screwworm flies. The name *Protocalliphora* is now applicable only to a genus of closely related European forms. Hall recognizes ten species of *Apaulina* and states that the habits of all species are similar. The larvae of all are obligate blood-sucking parasites upon nestling birds. There is apparently little, if any, host specificity, and probably any species of *Apaulina* will attack any of the known host species within its distributional area.

In summary, seven species of raptors, including five species of hawks, one eagle, and one owl, have now been reported as hosts for the bird nest screwworm flies, which have recently been placed in the new genus *Apaulina*.—HAROLD M. HILL, *Ann Arbor, Michigan, March 5, 1948.*

A New Western Race of the Nighthawk.—An apparently new race of Nighthawk was discovered during the course of the Carnegie Museum expedition to Idaho in 1947. It may be called

Chordeiles minor twomeyi, new subspecies

Type.—No. 131,534, Carnegie Museum, adult male; collected two miles southwest of Melba, elevation 3,000 feet, Owyhee County, Idaho, on June 23, 1947, by A. C. Twomey; original number 12,258.

Description.—Similar to *Chordeiles minor sennetti* but underparts more suffused white and barring darker and more distinct, with less buff ochre undertone; scapulars lighter with greater contrast in grays and browns; interscapular region darker, with less buffy intermixture.

In *sennetti* there is more ochraceous tawny and lighter brown, compared with the darker blackish-brown of *twomeyi*. The over-all whiteness of the underparts, with their more distinct and darker vermiculations, and the lighter scapulars, with their strong contrast against the darker browns, serve to define this race and make it easily separable from *sennetti*.

Measurements.—Wing, 199-202 (200.6) mm.; tail, 104.5-106.0 (105.1); culmen from base, 7.5-8.0 (7.66); tarsus, 13-14 (13.6).

Specimens examined.—Four; the type and a topotype; one from Lowman (7 miles east), Boise County, Idaho; and one from Adel (9 miles south), Lake County, Oregon.

Distribution.—Great Basin region of the Snake River, north to the South Fork of the Payette River, Idaho; and Warner Valley, southeastern Oregon, possibly extending into southeastern Washington and northern Utah. This race occurs in a region characterized by sagebrush (*Artemisia tridentata*), with major associates of *Atriplex nuttallii*, *Atriplex spinescens* and *Sarcobatus vermiculatus*. The birds were seen along the river bottoms where a deciduous growth of *Populus angustifolia* and *Cercocarpus ledifolius* existed.

Remarks.—This race is intermediate between *hesperis* and *sennetti*. It resembles *sennetti* in the lightness of the underparts and *hesperis* in the darkness of the back. One specimen shows a slight intergradation towards *hesperis*. It may intergrade with *sennetti* in the region of the mixed prairie association to the east.—ROLAND W. HAWKINS, Carnegie Museum, Pittsburgh, Pennsylvania, March 15, 1948.

The Whistling Swan in the Upper Pliocene of Idaho.—A fossil humerus of a swan was found by Mr. Cecil Childs two miles west of Hagerman, Idaho, in the summer of 1947. The bone consists of the proximal end, including all the deltoid crest; it is thoroughly mineralized and is well preserved except for an area broken out of the center of the palmar surface and the loss of the surface of the internal tuberosity. The specimen was found as surface float in the Hagerman Lake beds, Blancan age, Upper Pliocene, on the west side of the Snake River, in Twin Falls County. The locality is number V 3818 of the Museum of Paleontology of the University of California and the specimen is number 38306. Mr. J. A. Macdonald, who was collecting with Mr. Childs, states that in view of local topography there is no reasonable chance that the humerus could have washed out from beds of later age.

Howard (Carnegie Inst. Wash., publ. 551, 1946:141-195) in her study of the Pleistocene birds of Fossil Lake, Oregon, gave much attention to the osteology of swans and geese. She concluded that but two species of swan are present in the material from Fossil Lake, the modern Trumpeter Swan, *Cygnus buccinator*, and the extinct *Sthenelides paloreganus*. In contrasting the humeri of *Cygnus* and *Sthenelides* (included in *Cygnus* by many authors) she describes six points of difference in the proximal end of this element (pp. 163-164). In my own comparison of modern "*Sthenelides*" *olor* with *Cygnus columbianus*, I am able to verify each of these differences. In every detail the Hagerman fossil corresponds with the genus *Cygnus* in the restricted sense. There seem to be no constant differences in configuration between *C. columbianus* and *C. buccinator*, but there is of course a size differential. Humeri of 16 modern *C. columbianus* average 50.12 mm. in greatest width of head, with extremes of 48.0 and 53.5 and standard deviation of 1.45. An immature female *C. buccinator*, which may be presumed to be a small representative of its species, measures 57.2 mm. The Pliocene fossil measures 53.5 mm., which is within the limits of variability of the species *C. columbianus*. In all respects, then, this fossil agrees with the corresponding part of the modern Whistling Swan, *C. columbianus*, and may be so identified.

It is noteworthy that *Cygnus columbianus* dates back to the Upper Pliocene. Relatively great antiquity of avian species and genera, compared with mammals, has for some time been evident as a generalization. The Whistling Swan affords another significant example of this. It is strange that the Whistling Swan did not appear among the collections from the Pleistocene of Fossil Lake, but it is reported from the Pleistocene of southern California and Florida. Loye Miller (Condor, 46, 1944:25-32) reports swan material, some of it of the approximate size of *columbianus*, from the Owyhee Pliocene of Oregon and from the Pliocene near the Bruneau-Mountain Home bridge, Idaho. The material was too incomplete to permit exact identification, but the presence of two different species of swans was indicated by the sizes of scapular fragments.

I am indebted to Messrs. Childs and Macdonald and to Dr. R. A. Stirton for making the fossil available for study and to Drs. Hildegard Howard and Loye Miller for use of comparative material.—ALDEN H. MILLER, Museum of Vertebrate Zoology, Berkeley, California, January 15, 1948.

Wren-tits in the Roseburg Area, Oregon.—On a field trip into the interior valley of the Umpqua River near Roseburg, Douglas County, Oregon, on April 19, 1947, I was fortunate to find a small colony of Wren-tits (*Chamaea fasciata*) in the Garden Valley area some five miles northwest of Roseburg, near the confluence of the North and South Umpqua rivers. Two birds were seen in chaparral at very close range and a third was heard in the immediate vicinity. The two birds I observed were somewhat grayer and lighter in color than the Coast Wren-tit, *Chamaea fasciata phaea*, which is so common along the Oregon coastline. These birds undoubtedly represent the Pallid Wren-tit, *Chamaea fasciata henshawi*.

The Pallid Wren-tit has been found previously in the Rogue River Valley about fifty miles south of this area by Gabrielson and Jewett (*Birds of Oregon*, 1940). Since the Roseburg area is in the Upper Sonoran Life-zone, as is the inland Rogue River area, and in view of the general northwestward movement of Sonoran birds which is now evident, this northward extension of range is not surprising.—GORDON W. GULLION, Eugene, Oregon, October 4, 1947.

A Late Fall Record of the Poor-will in Oregon.—While driving north from Merrill, Klamath County, Oregon, during the early morning of October 26, 1947, I found a freshly killed adult male Poor-will, *Phalaenoptilus nuttallii nuttallii*, about two miles north of town. The bird's back was bruised, apparently when it had been hit by a passing automobile only a few hours before. A previous late record for this species was reported by Walker (*Condor*, 36, 1934:178) for Tillamook County, Oregon, on October 27, 1933.—STANLEY G. JEWETT, Portland, Oregon, December 30, 1947.

Scrub Jay and Sparrow Hawk Roosting in Cabin.—In the course of field work in eastern San Diego County, California, we made the following observations on roosting behavior. At 9:15 p.m. on July 23, 1946, we entered the screened porch of a deserted cabin in a dry wash two miles east of Jacumba. Here we found two Scrub Jays (*Aphelocoma coerulescens*) roosting singly on a horizontal supporting beam beneath the roof. One jay was captured with the aid of a butterfly net; the second, aroused by this activity, escaped through a rent in the screen.

As we entered the main room, a Sparrow Hawk (*Falco sparverius*) took wing and was netted immediately and then released. The behavior of this hawk upon its release seems of interest, and we quote from our field notes: "The hawk struck a defensive pose as soon as it was on the ground, backing away from the powerful flashlight, seemingly blinded. The bird fluttered a few feet and then, outside the circle of light, took flight with steady wingbeats, flying westward."

The cabin apparently offered more adequate roosting cover than did the sparsely foliated desert willow, creosote bush, and cat-claw of the surrounding area.—KEITH L. DIXON and PHILIP H. KRUTZSCH, *Museum of Vertebrate Zoology, Berkeley, California, March 11, 1948.*

Unusual Feeding Behavior of the Brown Thrasher.—On August 24, 1947, I saw a pair of Brown Thrashers (*Toxostoma rufum*) along Duck Creek in Scott County, Iowa, engaged in a most unusual feeding procedure. One of these birds was wading around in a shallow portion of the creek, and the water often reached the breast feathers. This individual was seen to plunge its bill into the water and pick up something which it swallowed. Study with five-power binoculars proved that the thrasher was feeding on aquatic water striders (Hemiptera of the family Gerridae) that were common in this portion of the creek. This is the first time I have ever observed this species preying upon this type of animal life.—JAMES HODGES, Davenport, Iowa, January 28, 1948.

An Altitudinal Record for the Great Blue Heron in California.—On June 13, 1947, I had a clear view of a Great Blue Heron (*Ardea herodias*) in flight in Center Basin, at 11,200 feet, in Kings Canyon National Park, Tulare County, California. This is 2,600 feet higher than the greatest elevation reported by Grinnell and Miller (*Pacific Coast Avifauna* No. 27, 1944:57) for the coastal race, *A. h. hyperonca*, and 2,300 feet higher than the record from Tuolumne Meadows of the interior race, *A. h. treganzai*. The bird observed was just one mile in an air line west of the Sierran crest.—MILTON HILDEBRAND, *Museum of Vertebrate Zoology, Berkeley, California, February 6, 1948.*

Occurrences of the Emperor Goose in California.—Enroute to San Francisco, California, on October 26, 1947, the writer had the good fortune to observe an Emperor Goose (*Philacte canagica*) resting on a mud flat a short distance from the Berkeley approach-ramp of the San Francisco-Oakland Bay Bridge. This is an unusual southern coastal record.

Emperor Geese have been reported previously in interior northern California. Fish and Wildlife Service officials at the Tule Lake Bird Refuge have provided me with records gathered by Ranger Lawson H. Brainerd while he was on duty at the Lava Beds Monument. In 1932 Mr. Theodore Nelson of Tulelake killed an adult bird. There were no further reports until 1937 when another adult bird was

taken by Fish and Wildlife Service officials at the Tule Lake Refuge. On December 8, 1941, Mr. C. G. Whitney of Klamath Falls, Oregon, killed a young bird, and during that season three additional birds were reported. All were young birds. Since 1941 no additional birds have been taken in this region. —DON C. FISHER, *Lava Beds National Monument, Tulelake, California, February 13, 1948.*

The Prothonotary Warbler in Arizona.—The Prothonotary Warbler (*Protonotaria citrea*) is characteristically a bird of low, wet, wooded places, both in periods of migration and nesting. It is found most commonly in regions of not over 500 feet elevation above sea level, but does occur sparingly up to 1000 feet elevation. This warbler is most abundant in the south, from the Brownsville district of Texas to the Atlantic seaboard, occurring north in decreasing numbers, to southern Ontario, southern Michigan, central Wisconsin and southeastern Minnesota; its westward range-limits are central Iowa, eastern Nebraska, central Kansas, central Oklahoma, and eastern Texas. It is therefore surprising that the Prothonotary Warbler should be taken twice in Arizona, approximately 800 miles west of its normal range, in a dry region, and at relatively high elevations. The first Arizona specimen recorded was taken by E. W. Nelson, on May 1, 1884, at Tucson, Arizona, at an elevation of 2300 feet (Swarth, *Pac. Coast Avif. No. 10, 1914:67*). The second record for Arizona is that of an adult male, now in my collection, taken by H. H. Kimball, September 8, 1924, along Cave Creek in the Chiricahua Mountains, Cochise County, about four miles northeast of Paradise, at an elevation of approximately 5000 feet. —MAX M. PEET, *Ann Arbor, Michigan, March 4, 1848.*

The Cardinal in Oregon—a Possible Explanation.—In *The Condor* (vol. 32, 1930:301) I recorded the occurrence of three Cardinals (*Richmondia cardinalis* subsp.) in Douglas County, Oregon. In this note I commented: "When and where they came from into the state of Oregon I have not the slightest idea." After nearly eighteen years a possible explanation is now available. The following letter has just been received from Prof. B. A. Thaxter of Lewis and Clark College, Portland, Oregon.

"Some time ago you told me about having seen 3 cardinals somewhere in the vicinity of Canyonville about 1930, I think. I was talking to a Mrs. Keeney, a teacher in the Riverdale School in Dunthorpe (Oregon) and chanced to tell her of your seeing the birds and wondering where they came from. She, at that time, 1930, was a teacher in Eugene (Oregon). She told me that they frequently drove south to southern Oregon and that they had stopped for lunch several times at Deer Park Inn not far from Canyonville. One time, she said, and it was around 1930, she got quite well acquainted with the proprietress there who had had some cardinals sent her by her son who lived in Texas. Mrs. Keeney could not remember the woman's name but at any rate, the lady told her that she had either let out some of them or some of them had escaped from their cage. She said they remained in the vicinity for about a year and that she saw them no more."

The exact place I saw these Cardinals in the summer of 1930 is about one-half mile up the creek south of the Deer Park Inn. I am perfectly satisfied that the letter from Professor Thaxter explains just how I happened to see these Cardinals in Oregon. —STANLEY G. JEWETT, *Portland, Oregon, January 30, 1948.*

NOTES AND NEWS



Fig. 29. Harry R. Painton, one of the founders of the Cooper Ornithological Club. Past President of the Board of Governors and of the Northern Division.



Fig. 30. Fred A. Schneider. On June 22, 1893, Schneider with Chester Barlow, Harry R. Painton and Wilfred H. Osgood founded the Cooper Ornithological Club.

The colored life-size portrait of a Red-tailed Hawk (*Buteo jamaicensis*) by Allan Brooks, reproduced as the frontispiece of this issue, is based on an adult male in the erythro-melanistic phase, collected at Comox, Vancouver Island, British Columbia, on January 19, 1931. Original notes by Brooks on color of soft parts are as follows: eye, light reddish brown, marked with dark burnt umber below pupil; orbital ridge, olive gray; cere, pale greenish yellow; gape, wax yellow; feet, chrome yellow.

COOPER CLUB MEETINGS

SOUTHERN DIVISION

FEBRUARY.—The regular monthly meeting of the Southern Division of the Cooper Ornithological Club was held on February 24, 1948, 145 Allan Hancock Hall, University of Southern California, Los Angeles. The following names were proposed for membership: Andrew J. Berger, Dept. Zoology, University of Michigan, Ann Arbor, Mich., and William Allan Lunk, 1328 Springfield St., Willow Run, Mich., both by G. M. Sutton; James Gilligan, care of Boise Junior College Library, Boise, Idaho, by John McB. Robertson; Ralph Frank Baldwin, 301 Morris Ave., S.E., Grand Rapids 3, Mich., Mrs. Kate Brown, 144 19th St., Pacific Grove, Calif., T. C. Carter, Alva, Okla., Herman F. Chapman, 712 S. Dakota Ave., Sioux Falls, So. Dakota, Joe Clyde Creager, L. A. Cann

Drive, Drawer 1267, Ponca City, Okla., Thomas Wallace Donnelly, 1432 44th St., N.W., Washington 7, D.C., G. L. Garvey, Mercer University, Macon, Georgia, Laura Greely, 904 Kendall Ave., So. Pasadena, Calif., John Henry Helm, Trailer 105, Unit 2, Montana State College, Bozeman, Montana, Charles A. Keefer, P. O. Box 68, Austwell, Texas, Josiah Keely, Box 383, Huntington, L. I., N.Y., Forrest B. Lee, 1502 Kilian Blvd., St. Cloud, Minn., Mrs. Lucile Marie Mannix, 790 Prospect, Winnetka, Ill., Robert T. Scholes, 260 Crittenden Blvd., Box 243, Rochester, N.Y., Willard F. Stanley, State Teachers' College, Fredonia, N.Y., and Raymond Drake Van Pelt, 2687 Waverly Dr., Los Angeles 26, Calif., all by C. V. Duff.

Dr. John S. Garth presented an account of his bird observations in the Everglades National Park area of Florida.—DOROTHY E. GRONER, *Secretary*.

MARCH.—The regular monthly meeting of the Southern Division of the Cooper Ornithological Club was held on March 30, 1948, 145 Allan Hancock Hall, University of Southern California, with 60 members and guests present. The following names were proposed for membership: Isabelle Connell, P. O. Box 116, Spadra, Calif., by D. E. Groner; Robert Judkins Erwin, 149 31st St., Ogden, Utah, by F. M. Erickson; Robert Minturn Lockwood, M.D., Veterans' Administration Hospital, Alexandria, La., and Perry R. F. Marshall, P. O. Box 1199, Santa Barbara, Calif.,



Fig. 31. Walter B. Sampson, member of the Club since November 4, 1894.



Fig. 32. A. M. Ingersoll, a member of the Club since February 2, 1895.

by W. L. Chambers; Gerald (Talbot) Rogers, General Delivery, Riverside, Calif., by Harold Michener; Mrs. Lovie May Whittaker, 833 Livingston Ave., Syracuse 10, N.Y., by Lena McBee; Merrill Wood, 811 N. Allen St., State College, Pa., by J. McB. Robertson; John Brander Austin, 464 State Rd., Bala Cynwyd, Pa., Augustus L. Baker, 389 W. Blackwell St., Dover, N. J., Sir Charles Frederic Belcher, Kinangop, Kenya, East Africa, Dr. Elizabeth M. Boyd, Zoology Dept., Mt. Holyoke College, So. Hadley, Mass., Miss Hazel L. Bradley, 301½ Third St., Jackson, Mich., A. G. Byrone, Box 634, Rodeo, Calif., Edward L. Chalif, 37 Barnsdale Rd., Short Hills, N. J., Senor Rafael Martin del Campo, Instituto de Biología, Casa del Lago, Chapultepec, Mexico D.F., Mexico, Marietta Eighme, 1201 No. Court St., Ottumwa, Iowa, Mrs. Alfred L. Eustice, Bright Land Farm, Barrington, Ill., Ben J. Fawver, 512 W. White St., Champaign, Ill., Richard W. Frederickson, 1019 Kentucky St., Lawrence, Kansas, Miss Addie Fromholz, 1101 W. Cherokee, Enid, Okla., Jessie B. Gill, 2327 Holgate Square, Los Angeles 31, Calif., Clem C. Glass, 4747 Alta Canyada Rd., La Canada, Calif., Kathryn Ann Grave, 4925 29th Ave. South, Minneapolis 6, Minn., Arthur W. Halverson, 5705 W. Erie St., Chicago 44, Ill., John Patrick Harville, San Mateo Junior College, San Mateo, Calif., Thomas Francis Higgins, 3273 43rd St., Astoria 3, N.Y., Martin Karplus, 259 Otis St., West Newton, Mass., S. Walter Leshner, 303 N. 17th St., Corvallis, Oregon, Dr. Harold Wesley Magar, 619 5th St., Brookings, So. Dakota, Mr. Duryea Mor-

ton, R. D. 1, Sinking Spring, Pa., Mrs. M. F. Murphy, 2333 Holgate Square, Los Angeles 31, Calif., Homer Wayne Phillips, Dormitory B, San Jacinto Blvd., Austin, Texas, Edward J. Reimann, 4147 "O" St., Philadelphia 24, Pa., Carl H. Richter, 703 Main St., Oconto, Wisconsin, Walter William Sedwitz, 229 W. 36th St., New York 18, N.Y., Richard M. Straw, 973 W. County Rd. B, St. Paul 8, Minn., Edward P. Terry, 2586 Aberdeen, Los Angeles 27, Calif., Mr. Landon B. Thomas, 1006 Blaine St., Edgerton, Wisconsin, Miss Marion Weisfield, 1914 Browning Blvd., Los Angeles 37, Calif., and John L. Wolff, 38 Crane Rd., Scarsdale, N.Y., all by C. V. Duff.

The following resolutions were read and unanimously adopted:

WHEREAS, in the death of George Gordon Cantwell on March 3, 1948, the Cooper Ornithological Club lost a valued friend and loyal member of over thirty years standing, who served the Club as Vice-president of the Southern Division, and

WHEREAS, he not only himself furthered the knowledge of western ornithology but was responsible for inspiring many of the young ornithologists of today,

THEREFORE, BE IT RESOLVED, that the Southern Division of the Cooper Club express its deep regret at the passing of its good friend, and at the same time, its appreciation of his service to the Club and to the science of Ornithology.

The speaker, Mrs. Margaret M. Nice, presented an account of her "Study of the Nesting of the Carolina Wren."—DOROTHY E. GRONER, *Secretary*.

For Sale, Exchange and Want Column.—Each Cooper Club member is entitled to one advertising notice in any issue of *The Condor* free. Notices of over ten lines will be charged for at the rate of 15 cents per line. For this department, address JOHN MCB. ROBERTSON, Buena Park, California.

FOR SALE—A new bird book for the entire West is just off the press; 400 pages; 600 illustrations; complete analytical keys for all the birds in the West—the picture of the bird right with its description in every case; drawings of birds are two inches in diameter. Price \$3.75 plus 7¢ postage; order from the author.—ERNEST S. BOOTH, *Walla Walla College, College Place, Washington.*

BOOKS WANTED—Depending on condition, I will pay \$8.00 to \$20.00 for Bewick (1794-1804); \$35.00 to \$60.00 for Ord's Wilson (1828-29); \$15.00 Grosart, Alexander Wilson, 2 vols., 1876; \$10.00 Grosart, Alexander Wilson, vol. 2 only; also any other poetical writings by Wilson or any other books by him or about him.—EMERSON STRINGHAM, *P. O. Box 986, Kerrville, Texas.*

FOR SALE—A complete set, 15 volumes, of my series of *Bulletins on Life Histories of North American Birds*. The first volume is a bound reprint, but the others are all in the original paper covers. The set will be sold to the highest bidder, if the price is high enough.—A. C. BENT, *140 High St., Taunton, Mass.*

FOR OOLOGISTS, still plugging away under that complex, I have some of the best small tools to offer.—F. M. DILLE, *822 Grand, Nogales, Arizona.*

PREPARATION OF MANUSCRIPTS FOR THE CONDOR

Articles published in the Condor normally are written by members of the Cooper Ornithological Club. Practically all the Club's money goes into the magazine; no editor and no business manager receive any pay other than the satisfaction of doing a service worthily. The preparation of good copy by the author will contribute greatly to accuracy of published output, dispatch in handling, and economy of production.

To be acceptable for inclusion in the Condor, articles must not duplicate in any substantial way material that is published elsewhere. Any type of subject bearing on birds may be considered; but the geographic areas of primary concern are western North America, Central America, and the Pacific Basin. Manuscripts may be submitted to any one of the editors (see inside front cover for address). Proofs with edited manuscripts will be sent to authors, at which time reprints may be ordered.

In the interests of accuracy and economy, observe the following: do not duplicate data in text, tables, or charts; check citations to original sources and verify text references; quoted statements must be exact replicas of the original; preferably use vernacular names applicable to the entire avian species (for a guide in this regard, see "The Distribution of the Birds of California," *Pac. Coast Avif.* No. 27, 1944:5-34); in general, avoid subspecific vernaculars; insert scientific names for species but not the subspecific name except in taxonomic papers or where the race concerned has been critically determined by the author or his collaborators; revise the manuscript repeatedly to remove superfluous words and phrases, immaterial detail, and repetitious statements.

Note Condor style and usage. "General Articles" and the "Field and Study" items are set up in different form. Provide a concise, meaningful title, and, where needed, subtitles within the text. Footnotes are not used. The address line may serve to indicate institutional connection, and to it should be added the date of transmittal of the manuscript. Terminal bibliographies are desirable where five or more titles are to be cited; otherwise, the references may be included in the text. For bibliographic style, note closely the practices employed in recent volumes of the journal. A factual summary is recommended for longer papers.

Rules for copy.—(1) typewrite material, using one side of paper only; (2) double space *all* material and leave liberal margins; (3) use $8\frac{1}{2} \times 11$ inch paper of standard weight (avoid onion skin); (4) carbon copies are not acceptable; (5) place tables on separate pages; (6) number pages in upper right hand corner.

Illustrations.—Photographs should be glossy prints of good contrast. Make line drawings with India ink; plan linework and lettering for at least $\frac{1}{2}$ reduction; do not use typewritten labels on the face of the drawing. Provide typed legends on separate sheets.

Helpful references on writing: *Manual of Style*, University of Chicago Press, and *Rules of the Editorial Committee*, University of California Press. On scientific nomenclature: A.O.U. Check-list (with supplements 19, 20, 21 and 22) and *Pacific Coast Avifauna* No. 27; authors are not required to follow either of these works.

THE EDITORS OF THE CONDOR.

